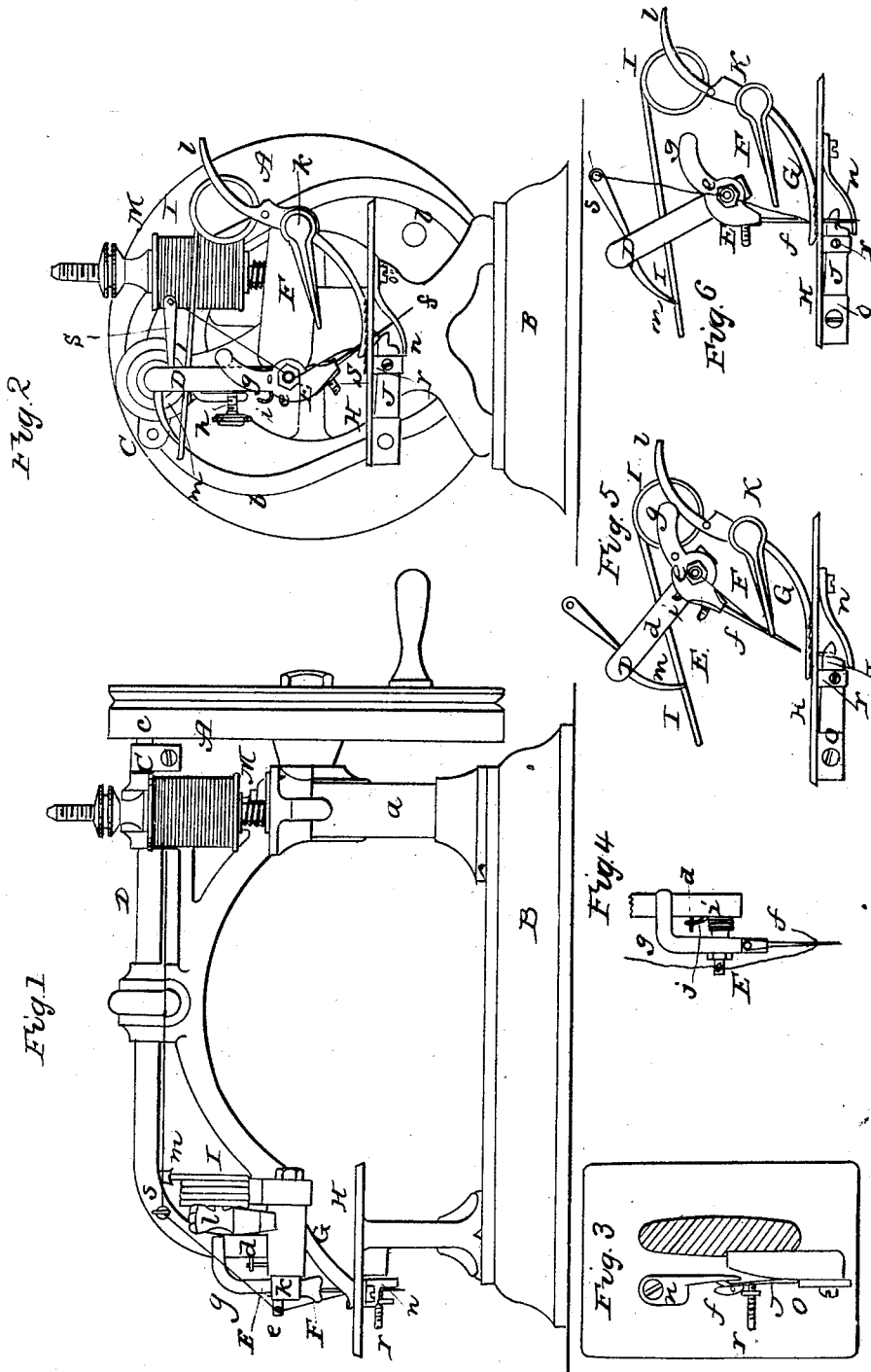


J. E. A. GIBBS.

Sewing Machine.

No. 21,751.

Patented Oct. 12, 1858.



UNITED STATES PATENT OFFICE.

JAMES E. A. GIBBS, OF MILL POINT, VIRGINIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 21,751, dated October 12, 1858.

To all whom it may concern:

Be it known that I, JAMES E. A. GIBBS, of Mill Point, in the county of Pocahontas and State of Virginia, have invented a new and useful Improvement in Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification, and in which—

Figure 1 represents a side elevation of a sewing-machine constructed according to my improvement; Fig. 2, a front end elevation thereof; Fig. 3, an inverted plan of the cloth bed or table, with the mechanism arranged on the under side thereof for operation in connection with the needle; Fig. 4, a view in detail, showing the needle, needle-stock, and mode of attaching the latter to the arm or crank-shaft which operates the needle; and Figs. 5 and 6 represent in detail or detached in different positions the several devices more immediately pertaining to the formation of the stitch and holding of the material to be sewed.

My improvement relates to that class of sewing-machines in which a single thread is used to produce a series of chain-stitches by the joint action of a hook and needle, and in which the material being sewed is fed by the needle.

In the accompanying drawings the driving grooved or cam wheel A is shown arranged in the rear on a shaft projecting from a standard, *a*, of the bed-plate B. This wheel has its operating-groove *b* on its inner face, into which groove the wrist-pin *c* of a crank, C, fits, said crank being attached to the vibrating needle-shaft D, and the groove *b* of the wheel so shaped as during each revolution of the wheel the needle-shaft D is, by the connection of it with the wheel, as specified, vibrated twice.

The needle-shaft D, which works in suitable bearings, projects toward the front of the machine, and terminates at its front in a bent arm or crook, *d*. This crook *d* carries on a pivot-pin, *e*, which projects in front from the lower end of the crook, the needle stock or holder E, that is formed with a nozzle on one side to hold the needle *f*, and on the opposite side of the pivot-pin *e* with a curved arm, *g*,

which serves, in connection with an adjustable stop-screw, *h*, in the crook, to control the length of the stitch or feed given by the needle, as hereinafter described.

The needle-holder E, which turns loose on the pivot-pin *e*, has attached to it a spring, *i*, that hooks at its detached end, at intervals, onto a pin, *j*, which projects from the vibrating crook *d*, the office of which spring and action is to restrain in an elastic manner the turning of the needle-holder E, when the swinging of the crook *d* brings and keeps the needle *f* in gear with the notched needle-guide F during the commencement of the down and finishing portion of the up stroke of the needle. This needle-guide F consists of an arm, crank, or lever arranged in direction of the length of the feed, with its axial support *k* at right angles to the needle-feed. It is suitably formed at its outer end to guide the needle during the periods already specified of the needle-stroke, the use and necessity of a needle-guide at these points being well known, and is made capable of adjustment at its axial support, so as to change the position of its forward guiding end to suit different needles and needle strokes, feeds, or actions, in making which adjustment it will be seen there is not by this arrangement any tendency to press laterally on the needle relatively to the line of feed, at least no tendency to press on one side more than the other, whereby the straight line of feed of the needle is preserved during all adjustments of the said guide, and the "hang" and the manner of adjusting said guide admit of the nicest particularity of back or forward adjustment of the needle-guiding portion being made by slightly raising or lowering said portion without loss of time in effecting said adjustment or objectionably small action of the hand of the operator in making a small adjustment.

The cloth-holder G is here represented of a lever formation and hung in the axial support or bolt of the needle-guide; but such mode of suspension may be changed. A thumb latch-piece, *l*, serves to free the holder, when required, from all grip on the cloth when necessary to remove it from the table H, insert fresh cloth, or as circumstances may require; but in the regular action of the machine while

sewing the cloth-holder G is not raised from all grip or frictional hold on the cloth, either during the occasional feed of the cloth or otherwise, but has a continuous spring-pressure applied to it to produce grip on the cloth by means of a spring, I, attached at its one end to the holder, and having its other end project on the vibrating needle-shaft D, which carries a side piece, *m*, that during the vibration of the needle-shaft presses with more or less force, according to the position during vibration of said side piece, on the spring I, to give increased or diminished pressure to the foot of the cloth-holder on the cloth, as hereinafter described.

Underneath the table H, on one side, is arranged a needle-guide, *n*, and at a little distance from it, also underneath the table, is a spring-hook, J, or hook hung at the end of a spring fastened at its rear end, O, but left free to vibrate with the hook in front across the line of feed. This hook co-operates with the needle, and the proper adjustment of the former to the latter is or may be effected by a screw, *r*, acting on the hook or spring in front. The needle-thread passes from a spool, M, through a take-up projection, S, on the side of the vibrating needle-shaft, and through an eye in the pivot-pin *e* of the needle-holder, down to and through the eye of the needle. Upon turning the driving-wheel A in either direction, the action of the parts and feed being the same in whichever direction the wheel turns, the crook *d* is vibrated each revolution of the driving-wheel a suitable distance on one side of a vertical line or plane which, if extended, would bisect the needle-shaft longitudinally. Supposing the parts to be situated as in Fig. 5, in which the crook *d* is supposed to be commencing a movement from right to left, the spring *i* of the needle-stock E, clipping the stud *j* on the needle-shaft, keeps the needle *f* firm to the upper guide, F, and retains it in such contact until the needle has penetrated the cloth and table in its descent, which latter is effected by the swing by the crook *d*. During the continued descent of the needle against and down past or over the spring-hook J the needle leaves the upper guide, F. When the needle arrives in the position shown in Fig. 6, the further swinging of the crook *d* to the left, and till the crook arrives in a vertical position, causes the pointed end of the needle to be swung back along the under guide, *n*, and on the crook reversing its action from left to right the pointed end of the needle is vibrated forward again along the under guide, *n*, and throws the loop of the thread over the hook J, and the retraction of the needle then proceeding, the needle is thrown into spring-hold and guiding-gear or contact again with the upper guide, F, for the closing portion of the needle's retraction. The hook J being of an elastic character, while it is restricted from motion in every direction but to one side, (crosswise of the feed,) readily allows of the needle, by slight pressure on it, passing and

slightly moving it, which does away with the springing of the needle, that exposes it to being bent or breakage, for the throwing of the loop over the hook and to admit of the needle passing the projecting hook.

The cloth is fed by the needle toward the swing of the crook to the left just before the needle-point commences its return-stroke along the under guide, *n*. The cloth-holder G is not, as before mentioned, altogether free from the cloth while feed of the latter has been effected; but its pressure on the cloth is considerably reduced during and about the time of feed, so as to admit of the easy movement of the cloth by the needle, by reason of the relieving position or diminished thrust of the side piece or rod, *m*, of the needle-shaft on the cloth-holder pressing-spring I at this period. After the feed has been effected, however, and during all the intervals of action, when the cloth is required to be held firmly on the table, the rocking of the needle-shaft causes the lever *m* to depress or act on the spring I, so as to increase its power on the cloth-holder. Thus the cloth is never left free from a spring-grip on it to keep it steady, is restrained from rising or leaving the table, getting ruffled or out of place or its stitch out of line, and sufficient freedom given it for feed. Such variable-pressure cloth-holder altogether differs from those intermittent pressure-pads which cease hold during the feed or move with the feed, and from those constant-pressure pads or holders whose pressure is not automatically variable, but either press too lightly for firm grip when the cloth requires to be held, or too firmly to admit of an easy feed of the cloth by the needle from under them. The feed of the cloth takes place, as described, toward the completion of the vibration of the crook *d* to the left by the crooked arm *g* of the needle-holder E then coming in contact with the stop-pin *h*, which prevents the further swing of the needle-holder independent of the swing of the crook in the finishing portion of its stroke to the left, and so the cloth is fed by the needle and the degree of feed is regulated by the length of stop-pin protruding to arrest the independent swing of the needle-holder. In the second descent of the needle it enters the loop left on the hook by the former action of the needle, which is the action represented as about to be performed in Fig. 5, and, after having passed through the former loop, the needle draws said loop off the hook in the side swing of the needle along the lower guide, *n*, and in the reversal of said side action throws a fresh loop of the thread passed through the former loop over the hook, after which the needle retracts and draws the stitch completed by the addition of the former loop tight, producing by such action the well-known chain-stitch.

Having thus fully described my improvements in sewing-machines, what I claim as my invention, and desire to secure by Letters Patent, is—

In combination with an eye-pointed needle

vibrating up and down and back and forth in a plane passing through the line of feed, the spring-hook J, or a hook constructed so as to yield sidewise or laterally of the path of the needle when actuated by said needle, in the manner and for the purpose of operating substantially as described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

JAMES E. A. GIBBS.

Witnesses:

HENRY A. HORTON,
JOHN M. ARNOLD.