J. E. A. GIBBS.

SEWING-MACHINE.

No. 171,559. Patented Dec. 28, 1875.

Fig. 1.

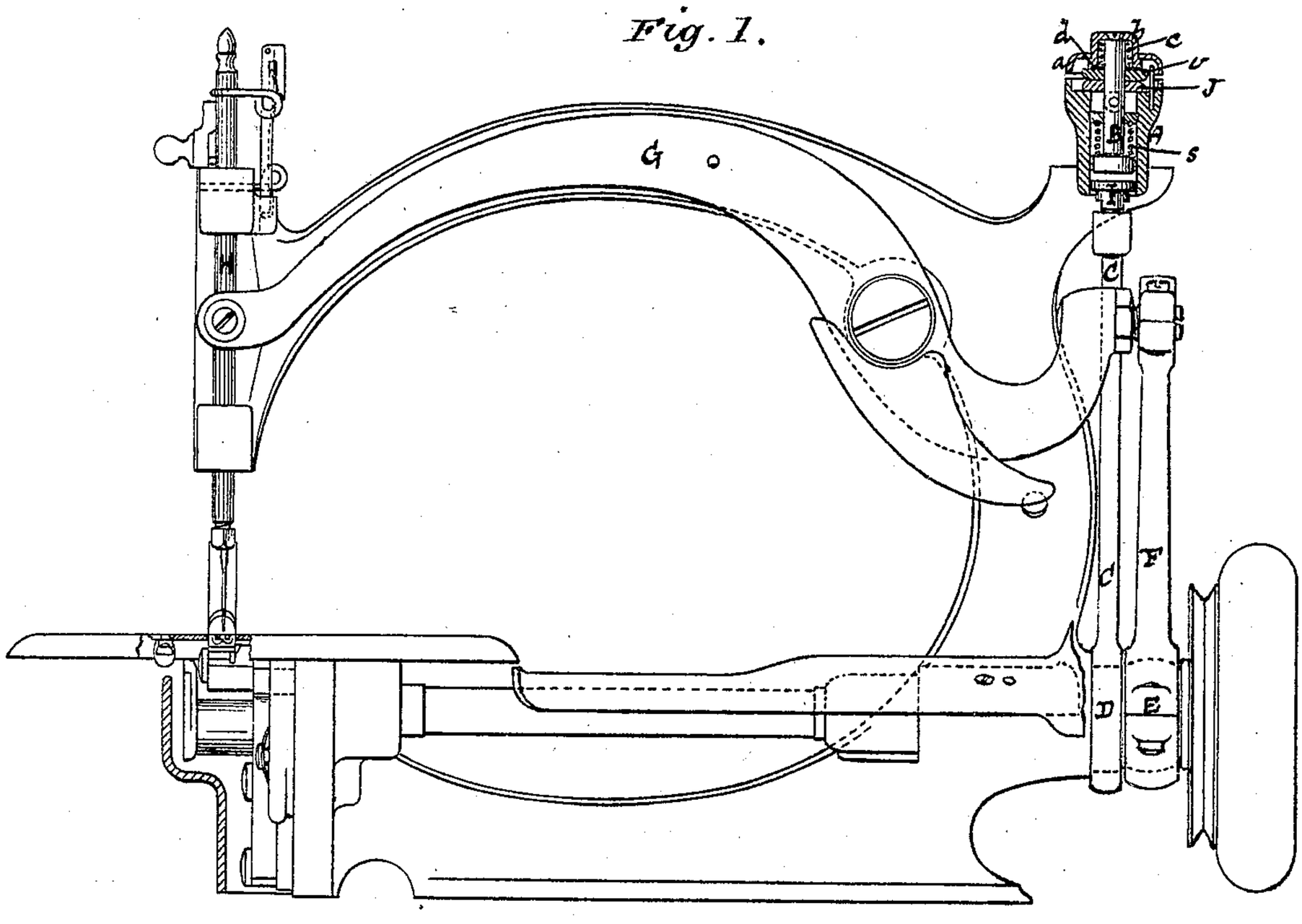
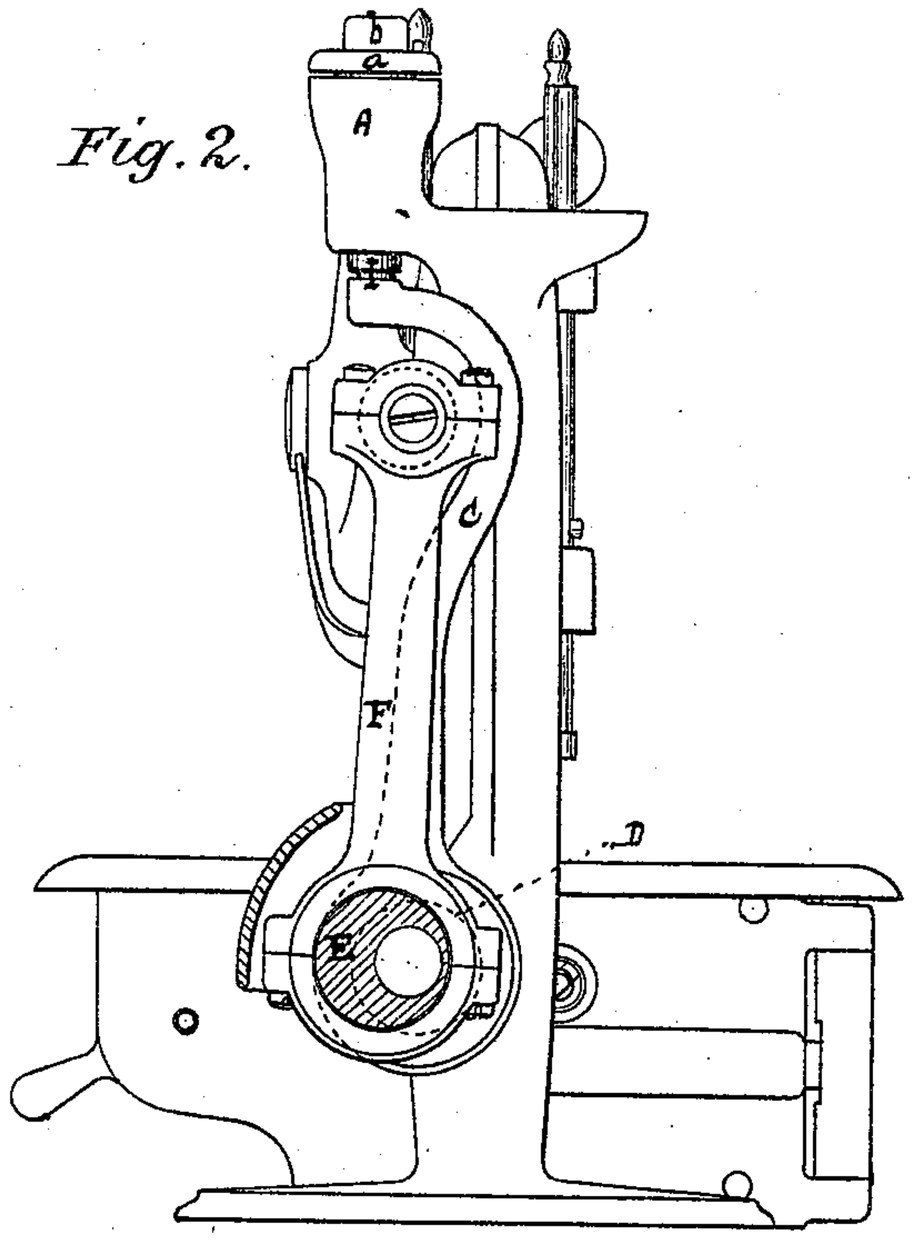


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES E. A. GIBBS, OF STEELE'S TAVERN, VIRGINIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **171,559**, dated December 28, 1875; application filed May 25, 1875.

To all whom it may concern:

Be it known that I, JAMES E. A. GIBBS, of Steele's Tavern, Augusta county, Virginia, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification:

In shuttle or other lock-stitch machines it is desirable and important for perfect sewing that the two threads shall interlock as nearly as possible within the body of the cloth—that is to say, the needle-thread should be drawn down and the under thread up into the goods, so that there shall be no appearance of loops on either side of the fabric. In order to effect this, in machines heretofore made and used having an invariable tension, the under thread being drawn up by the action of the upper thread upon it, and this action being necessarily continued in order to draw thread through the tension to form the next stitch after the under thread is drawn into its proper place in the goods, reliance had to be placed on the increased friction produced by the drawing up into the goods of the under thread to arrest any further movement of it into or through the goods; but, inasmuch as this friction varies with different fabrics with the thickness of the thread, &c., there is no certainty of uniformly perfect sewing.

I have succeeded in accomplishing the desired result without fail, and independently of the thickness of fabric or thread, by the employment of a tension device acting on the under thread substantially as follows: The tension device acts directly upon the upper thread, and through the intermediary of the latter thread upon the under thread. The tension clamps the thread firmly, and to all intents and purposes rigidly, during the greater part of the needle stroke, releasing it momentarily, or for a brief period, at a certain point during the ascent of the needle, at which time the take-up draws through the tension the supply of upper thread needed for the next stitch. Thus much in general explanation.

The particular feature of my invention is found in this, that the movements of the tension are so timed with relation to those of the stitch-forming devices that during the ascent of the needle, and while the bobbin or shuttle thread is drawn up by the loop of the upper thread, the tension is so great that no upper thread can be delivered, and therefore the loop is necessarily carried up, drawing with it the under thread up into the goods, at which point the tension is suddenly released, preventing further drawing up of the two threads. By thus timing the movements of the tension the two threads, in the completed stitch, meet within the body of the goods, and their point of interlocking is perfectly concealed, and the stitching on each side of the goods presents the same appearance.

The manner in which my invention is or may be carried into effect will be understood by reference to the accompanying drawing, in which I have represented my invention as applied to a lock-stitch machine of the rotary-hook kind.

Figure 1 is a side elevation of the machine, with the tension device in vertical central section. Fig. 2 is a rear view of the machine.

The tension device shown is that, or substantially that, patented to Wilcox & Carleton, June 27, 1871, Letters Patent 116,521, embodying, however, some modifications of the thread clamping and holding devices of said patented tension.

A is the inclosing-case; B, the movable spindle; *a*, the protecting-cap, fixed to the head of the spindle; *s*, the spring by which the clamping action is effected; J, the lower of the two thread-clamping surfaces or rings, and *v* the upper clamping-surface. These parts are constructed and arranged together substantially in the manner described in the Letters Patent above referred to, save in the respect that the two parts *v* and J act alternately to positively clamp and hold the thread, and to exercise the gentle pressure requisite to permit the requisite amount of thread to be drawn at the proper time through the tension.

By thus arranging the said parts to perform the above double duty I dispense with the two distinct sets of devices employed for the same purpose in the patented tension.

The parts *v* and J are enabled to so operate by the following means: The upper disk *v* rests loosely on the lower one, J, the spindle B passes loosely through them, and above the upper disk it carries, or is formed with, an enlargement, *b*, chambered to receive a light spring,

c, which is under slight compression, and bears upon the upper disk. The enlargement or head *b*, when the spindle is down, bears forcibly upon the disk *v*, pressing it so tightly upon the under disk J that the thread between the two disks is clamped rigidly. When, however, the spindle rises, the head is lifted, the upper disk is thus relieved from clamping-pressure, and is subjected at that time to the action of the spring *c* alone, whose force is such as to exercise only that slight pressure which is requisite to prevent too free delivery of the thread. Between the head *b* and upper disk is interposed a sound-deadening washer, *d*, to prevent noise during the operation of the machine.

The spindle is intermittently operated by an adjustable tappet, I, on the upper end of the connecting-rod C, and working in the lower cylindrical open end of the case A, as described in the above-named Letters Patent.

The needle, pull-off, take-up, feed, and revolving hook, and other devices forming part of the sewing-machine, are of ordinary or suitable construction, and require no description here. The spindle, through the intermediary of the connecting-rod and tappet, is operated by an eccentric, D, on the driving-shaft. (Indicated by dotted lines in Fig. 2.) This eccentric is so placed that the lifting of the tension to release the upper thread takes place just about the time the needle has completed its upstroke. The needle-operating eccentric is lettered E, the connecting-rod F, vibrating needle-arm lever G, and needle-bar H.

Thus it will be seen that during the upstroke the clamping of the upper thread by the tension will cause the loop formed by said thread to be drawn up. As this loop has engaged the lower thread the latter will be drawn up also, and inasmuch as the upper thread is clamped until about the time the upstroke of the needle terminates, the consequence will be that the under thread will inevitably be drawn into the goods or fabric, and that the point of junction or interlocking of the two threads will be within the body of the goods. The tension being released at this point, the two threads remain in this position without further disturbance, and thus is accomplished the object which I have in view.

I desire to state in conclusion that I do not claim the herein-described tension *per se*, except in so far as I may have improved the structure of the same in the particulars above noted; nor do I confine myself to the use of this special tension, inasmuch as I may employ any tension operating to intermittently clamp and release the thread at the time, and for the purpose specified.

What I claim, therefore, and desire to secure by Letters Patent, is—

In a lock-stitch sewing-machine, the combination, with the mechanism for delivery and interlocking the two threads, of a tension arranged to act on the under thread through the intermediary of the upper thread, at the times and in the manner set forth.

In testimony whereof I have hereunto signed my name this 22d day of May, A. D. 1875.

JAS. E. A. GIBBS.

Witnesses:

M. BAILEY,

EWELL A. DICK.