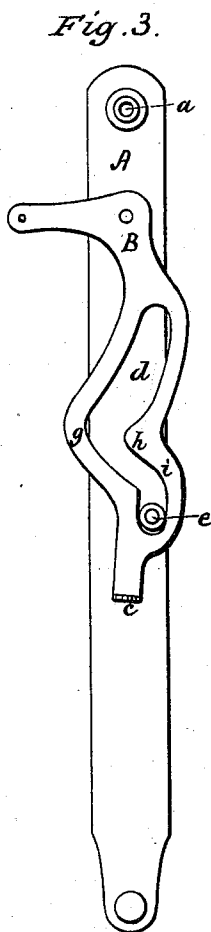
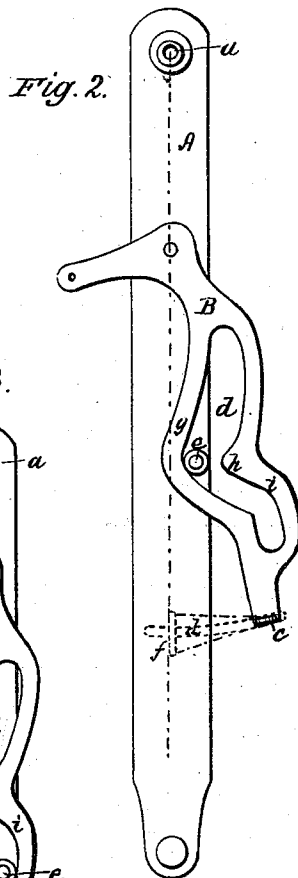
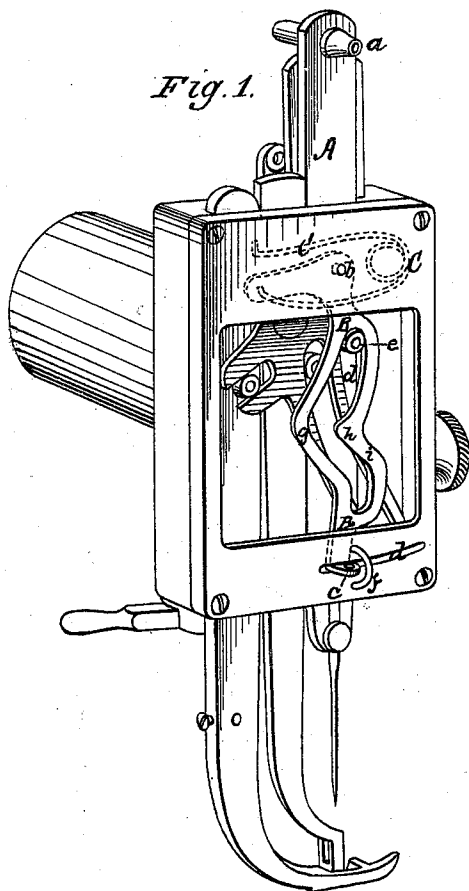


T. M. RICE.

SEWING-MACHINE THREAD CONTROLLER.

No. 176,686.

Patented April 25, 1876.



Witnesses:
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UNITED STATES PATENT OFFICE.

T. MARSHALL RICE, OF KALAMAZOO, MICHIGAN.

IMPROVEMENT IN SEWING-MACHINE-THREAD CONTROLLERS.

Specification forming part of Letters Patent No. 176,686, dated April 25, 1876; application filed March 6, 1876.

To all whom it may concern:

Be it known that I, T. MARSHALL RICE, of Kalamazoo, Michigan, have invented certain new and useful Improvements in Sewing-Machine-Thread Controllers or Take-Ups, of which the following is a specification:

My invention relates to that class of sewing-machines which control the thread in part by its being passed through or over the needle-bar or some part moving therewith.

The thread-controller that I have devised for a sewing-machine of this kind consists of a slotted vibratory lever hung on a horizontal axis. The lever is operated by a pin or stud on the needle-bar, which travels up and down in the cam-slot in the vibratory lever during the rise and fall of the needle-bar. The lower or free extremity of the slotted lever is provided with an eye or hook, which moves to and from a stationary staple or one or more hooks or eyes on the front of the head of the machine. The lever is acted on by a spring, which tends to swing or move it away from the staple. The cam-slot in the lever is formed in such manner as to cause the lever to exercise on the thread a yielding action, so long as the needle is above the cloth, and a positive action while the needle is in or below the cloth.

In the accompanying drawing, Figure 1 is a perspective view of so much of a sewing-machine as is needed to illustrate my invention. The remaining figures will be referred to hereafter.

In illustration of my invention I have represented it as applied to the well-known Davis vertical feed sewing-machine. Fig. 1 represents the head of such a machine, with the front plate partly removed to expose the working parts.

In this machine the thread is controlled in part by passing through the eye *a* on the upper end of the vertically-reciprocating needle-bar *A*.

The machine being well known and in extensive use, it is not necessary for me to describe its general construction and operation. I shall, therefore, confine myself to a description of the parts in which my invention is comprised. On the rear face of the front plate is hung on a horizontal pivot or axis, *b*, the vibratory take-up lever *B*. The lower or free end

of this lever has an eye, *c*, which projects beyond the face of the front plate through a slot or opening, *d*, therein, curved to follow a circle, of which the axis *b* is the center. In the lever is formed a cam-slot, *d*, as shown, into which projects a pin or roller-stud, *e*, which is fixed to and moves with the needle-bar *A*. The distance between the ends of the slots, taken in a right line, equals the length of the stroke of the needle-bar. On the front plate is a staple, *f*, toward and away from which the eye *c* moves. The thread passes from the eye *a* through the staple, (under the upper leg thereof,) thence down through the take-up eye *c*, and thence back through the staple, (over the lower leg thereof,) and thence to the needle. The course of the thread is indicated by dotted lines in Fig. 2, which is a diagram representing the take-up lever and the needle-bar detached. To the shorter arm of the take-up lever is connected a spring, *C*, shown by dotted lines in Fig. 1, which tends to throw the lower end of the take-up lever to the right, away from staple *f*, and consequently to cause the side *g* of the cam-slot to bear against the stud *e*. The cam-slot below the point *h* is of a width to receive the stud without allowing any appreciable play. Above that point it has more width, so as to allow of play between the lever and the stud.

The operation is as follows: In Fig. 1 the needle is represented in its highest position. During the descent of the needle-bar, until the needle reaches the goods, a quantity of thread is rendered slack, which is taken up or retained by a nearly equal movement of the take-up lever, from the position in Fig. 1 to the position in Fig. 2, the change of position of the stud *e* corresponding to the movement of the needle-bar, and the spring *C* causing the take-up lever to remain in contact with the stud on the side *g* of the cam-slot. During this movement the thread is taken up only sufficiently tight to avoid, between the eye of the needle and the work, slack that might be caught by the point of the needle, leaving, however, the thread just slack enough to avoid displacing the lock of the stitch after tension draft. By further descent of the needle-bar to the position shown in Fig. 3, the take-up lever is caused to return to the staple, thus

throwing the thread slack for the passage of the shuttle or its equivalent through the loop below, in order to form the stitch. The needle-bar now rises, and by the time the stud *e* has, in ascending, returned to the position indicated in Fig. 2, the eye of the needle has reached the goods. During this time the spring C moves the take-up lever, with a yielding draft upon the thread, from the position shown in Fig. 3 to that shown in Fig. 2, and said lever draws above the work what thread is not drawn up by the needle-bar at *a*. If the friction upon the thread in the goods overcomes the spring C, the latter is supplemented and assisted by the roller-stud *e*, in contact with the side *i* of the slotted take-up lever, which exercises upon the thread a positive draft sufficient to avoid liability of threads being drawn upward through the eye of the needle during the remainder of the ascent. Contact between the roller-stud *e* and the side *i* ceases from the point *h* to the upper end of the slot, thus leaving the take-up lever free to yield to the draft of the thread sufficiently to avoid drawing the under thread upward into the work before the said under thread is properly drawn. The spring C continues, however, its action upon the thread to such an extent as to draw up into thin work whatever difference must be allowed for thick work.

Having described my invention and the manner in which the same is or may be carried into effect, I shall state my claim as follows:

1. In sewing-machines in which the thread is controlled in part by being passed through or over the needle-bar, or some part moving therewith, the vibratory take-up or thread-controlling lever, provided with a cam-slot formed and proportioned to operate in connection with a stud or pin on the needle-bar or other part moving in unison therewith, substantially as and for the purposes shown and set forth.

2. The combination of these elements, namely, the vertically-reciprocating needle-bar, the stud or pin thereon, the pivoted thread-controller or take-up lever, having a cam-slot formed and proportioned and engaging said stud substantially as described, and the take-up-lever spring, the combination being and acting substantially as set forth.

3. The combination of the needle-bar, the vibratory thread-controller or take-up lever, provided with a cam-slot formed and proportioned to operate substantially as described, the thread-eye on the end of said lever, the staple, or its equivalent, on the head of the machine, and the take-up lever-spring, these elements being combined to operate substantially as herein set forth.

In testimony whereof I have hereunto signed my name this 17th day of February, A. D. 1876.

T. MARSHALL RICE.

Witnesses:

J. H. DEAN,
GEORGE F. GREEN.