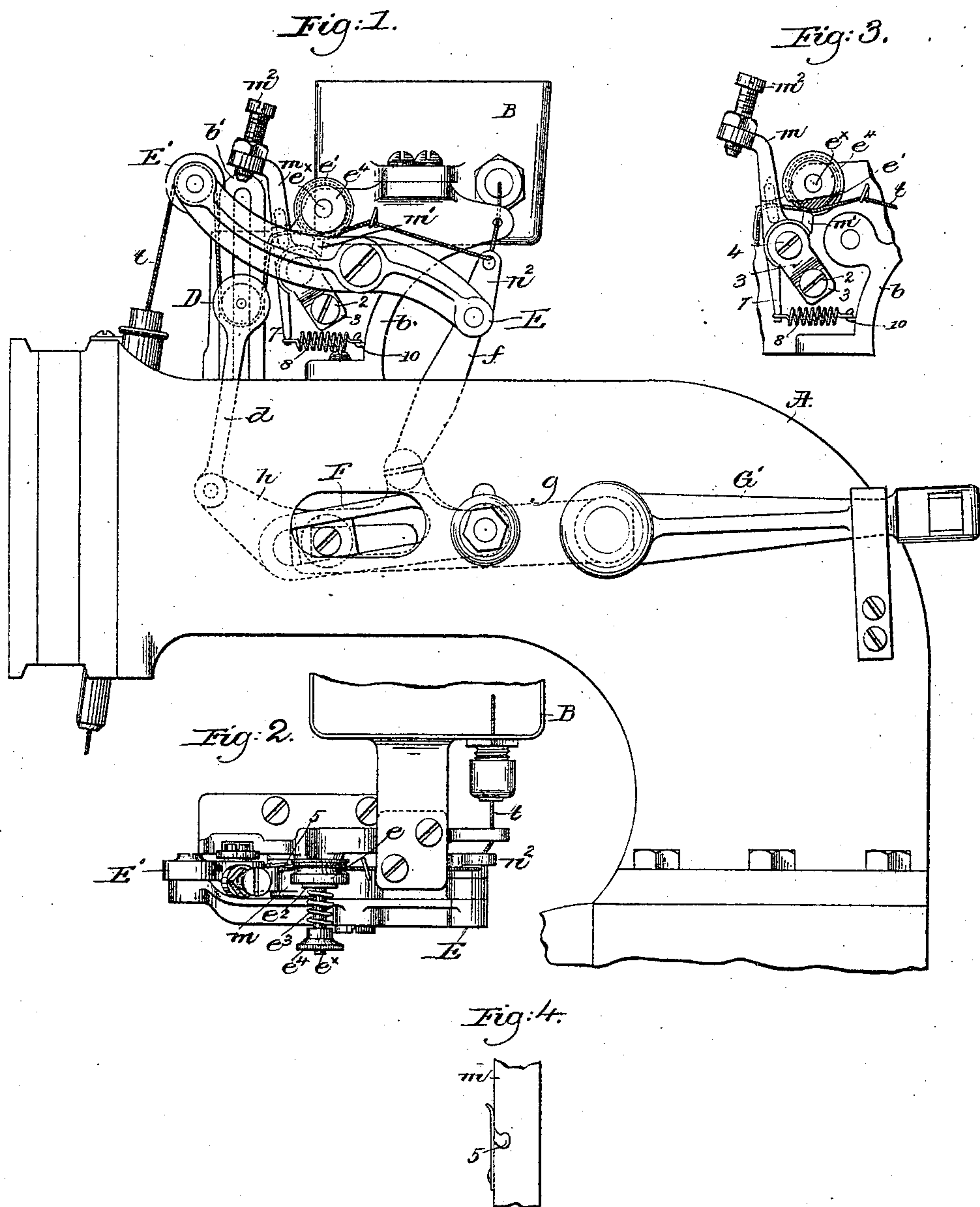


(No Model.)

E. P. ARNOLD.
THREAD CONTROLLING DEVICE FOR WAX THREAD SEWING MACHINES.
No. 421,889. Patented Feb. 25, 1890.



Witnesses.

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UNITED STATES PATENT OFFICE.

EZRA P. ARNOLD, OF ROCKLAND, MASSACHUSETTS.

THREAD-CONTROLLING DEVICE FOR WAX-THREAD SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 421,889, dated February 25, 1890.

Application filed June 12, 1889. Serial No. 314,020. (No model.)

To all whom it may concern:

Be it known that I, EZRA P. ARNOLD, of Rockland, county of Plymouth, State of Massachusetts, have invented an Improvement in Thread-Controlling Mechanism for Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The invention herein to be described is intended as an improvement on sewing-machines using wax-threads and making a lock or shuttle stitch.

My improvements are herein illustrated as employed in connection with needle-thread-controlling mechanism, substantially such as shown in United States Patent No. 374,936, dated December 20, 1887.

In sewing soles upon uppers in boots and shoes the thread used is very strong and is subjected to very considerable strain when the stitch is being set or finished, and in practice it has been found that the needle-thread soon cuts into the thread-clamping brake described in the said patent, and thereafter, owing to the changed condition of the surfaces of the clamping-brake, the locking-point of the stitches is not brought into the sole to the required point, the point where the thread should lock in order to make the stronger seam; and it has been found very difficult for the operator to so adjust the parts as to compensate for this wear.

In my invention I have dispensed with the thread-clamping brake represented in the said patent, and instead of it I have provided the machine with a wheel about which the needle-thread is wound once on its way to the take-up devices, and I have combined with the said wheel a spring-controlled brake-lever having a finger which enters the annular groove in the said wheel and acts directly against the thread therein, the said brake acting on the thread to prevent the rotation of the wheel and the delivery of thread during the action of the thread-fingers, which constitute the take-up.

The brake-lever referred to is acted upon by one of the fingers when the needle-thread is to be delivered, the said brake being turned in a direction to remove the finger referred to from the thread and permit the wheel to

rotate. In this way the devices acting to clamp the thread are not worn away, and it becomes possible to keep them just the same as to their surface-contour, so as to insure uniformity of stitch after the tension has been once adjusted.

Figure 1 in side elevation represents a sufficient portion of a wax-thread sewing-machine, taken in connection with the patent, No. 374,936, referred to, to enable my invention to be understood. Fig. 2 is a partial plan view of the devices shown in Fig. 1. Fig. 3 is a detail to be referred to, showing part of the standard with my improved brake-lever applied thereto, the wheel being partially broken out to represent the finger of the brake-lever as acting upon the thread; and Fig. 4, a detail showing a part of the brake-lever.

The arm A of the sewing-machine, the standard b, the slotted guide b' for a stud extended from the vertically-reciprocating thread-finger D, carried by the link d, the arm h, to which the link d is jointed, the lever G' g, the link f, the reciprocating thread-finger E' on the lever E, and the feeder-arm n² are and may be all as in the said patent, and as the operation of the said devices is well known in the taking up of the thread t going to the usual needle, such parts need not be herein specifically described, and instead of the particular devices referred to I may use any other well-known equivalent devices. Upon the standard b, I have mounted a stud e^x, upon which next the standard is placed a wheel e', having an annular groove, in which is laid the thread t, between the pull-off n² and the thread-finger D. This wheel e' is represented as having next its outer face a washer e², which is acted upon by a spiral spring e³, the strength of which may be regulated at will by a nut e⁴. The standard b has also secured to it, by screw 2, a fulcrum-block 3, having a stud-screw 4, (shown in full lines, Fig. 3, and by dotted lines in Fig. 1,) the said stud-screw serving as a fulcrum for the brake-lever m, having a finger m', which is shaped to enter the annular groove in the wheel e' and act directly upon the needle-thread at the point where a part of the said thread touches another part of the thread, due to a single wind of the needle-thread about the wheel e'.

The brake-lever *m* is provided with a guide-hole 5, (shown best in the detail, Fig. 4,) the said hole merely serving as a rest for the thread while the thread-finger D descends, as in Fig. 1. The brake-lever *m* has an arm 7, which is acted upon by one end of a spring 8, the opposite end of which is fixed to a stud 10 in such manner that the spring normally acts to keep the finger *m'* pressed against the thread on the wheel *e'*. To release the hold of the finger upon the needle-thread and enable the wheel *e'* to turn sooner or later during the formation of the stitch, the said lever *m* is provided with an adjusting or regulating screw *m*².

Referring to Fig. 1, it will be assumed that the thread-finger E' is rising, and the thread-finger D is descending to take up the slack in the needle-thread and set the stitch, and at such time the spring 8, acting on the brake-lever, causes the finger *m'* thereof, it acting directly against the needle-thread on the wheel *e'*, to hold the said thread directly against the wheel and prevent not only the movement of the thread, but also the rotation of the wheel. Now, as the thread-fingers at the proper time, as described in the said patent, reverse their motion to give up the slack thread in the formation of a stitch, the thread-finger D meets the regulating device, if used, or if not meets the end of the brake-lever *m*, turns the same upon its fulcrum, and removes the finger *m'* from contact with the thread on the wheel *e'*, thus leaving the said wheel free to be rotated about its stud by the strain upon the needle-thread, the resistance to the rotation of the wheel *e'* being only that due to the strength of the spring *e*³, which spring constitutes the tension-regulating spring for the thread.

The thread-fingers D and E' each in practice contain a suitable roller or other stud, as in the said patent, to act against the needle-thread, and, preferably, each roller is partially surrounded by a case or shield to protect the same from dirt, dust, &c.

The thread-fingers D and E' constitute a take-up, and while said fingers, moving simultaneously in opposite directions, are most desirable, because they may take up a large loop of thread with but a slight movement,

yet I do not desire to limit my invention to their employment with a take-up of the exact kind herein illustrated, for the same result could be attained by the use of a single lever, as in earlier patents—as, for instance, in United States Patent No. 231,954.

I claim—

1. The combination, with a rotatable tension-wheel having an annular groove therein about which the thread is wrapped, and a take-up, of a spring-controlled brake-lever having a finger shaped to enter said groove and act directly upon the thread surrounding the said wheel, the take-up device in its movement to give up slack thread acting to turn the said brake-lever and release the thread and wheel to permit a free delivery of thread, substantially as described.

2. The combination, with a rotatable grooved tension-wheel about which the thread is wrapped, and a take-up, of a spring-controlled brake-lever having a finger shaped to enter the groove in the tension-wheel and act directly upon the thread surrounding the said wheel, the take-up device in its movement to give up slack thread acting to turn the said brake-lever and release the thread and wheel to permit a free delivery of thread, and with a regulating device carried by the said brake-lever, by which the thread is released sooner or later, substantially as described.

3. The wax-cup, the pull-off device *n*², the guide *b'*, the thread-fingers E' D, means for operating them simultaneously in opposite directions, and the tension-wheel *e'*, about which the thread is wound, combined with the brake-lever having a finger, as *m'*, and with a spring to normally keep the said finger in contact with the thread on the tension-wheel and prevent the rotation of the latter, the brake-lever being actuated to release the thread by the thread-finger D as it rises to give up the slack in the needle-thread, substantially as described.

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

EZRA P. ARNOLD.

Witnesses:

GEO. W. GREGORY,
FREDERICK L. EMERY.