

No. 631,924.

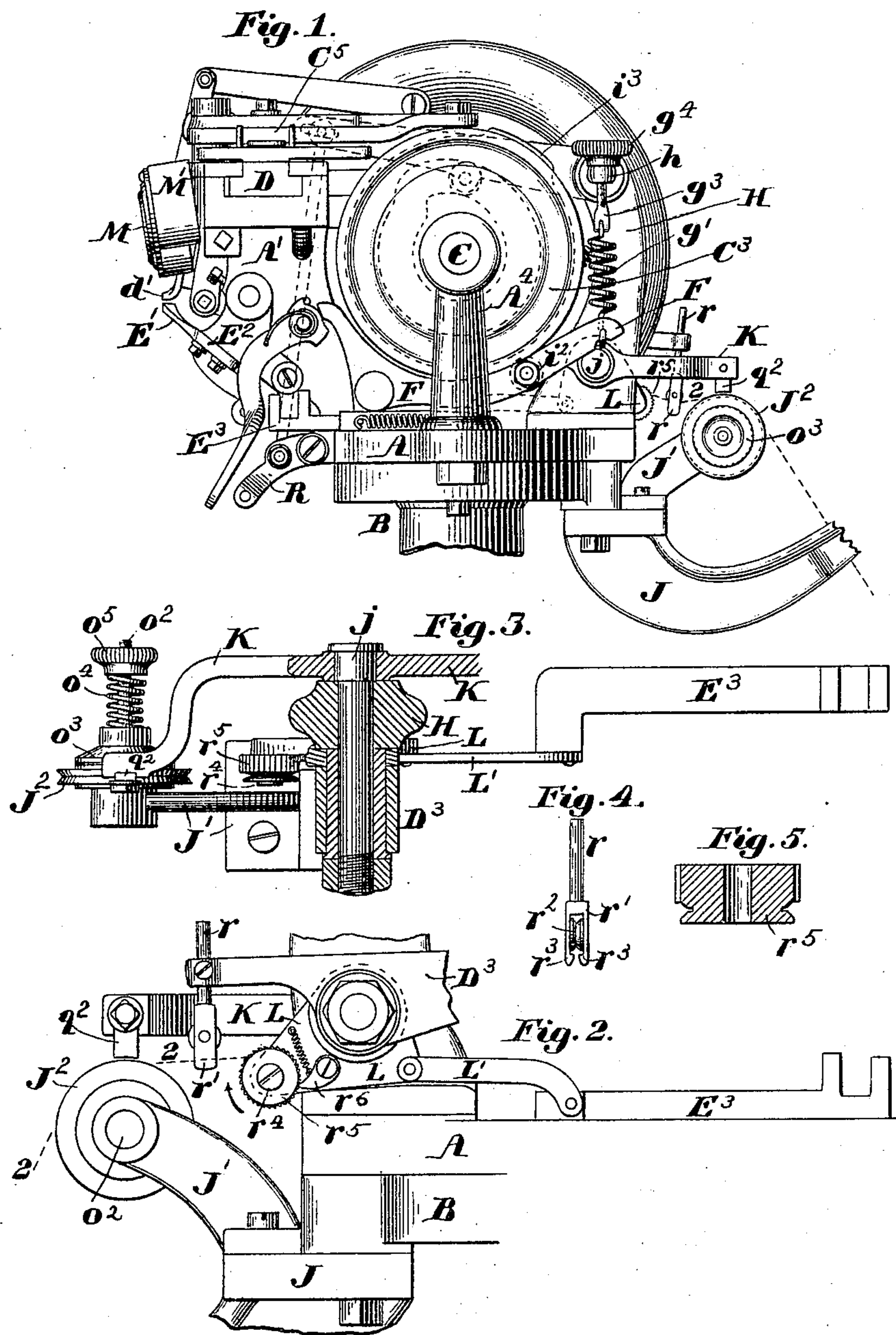
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J. E. BERTRAND.

THREAD CONTROLLING MECHANISM FOR SEWING MACHINES.

(Application filed June 2, 1899.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

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## THREAD-CONTROLLING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 631,924, dated August 29, 1899.

Original application filed February 7, 1899, Serial No. 704,812. Divided and this application filed June 2, 1899. Serial No. 719,078. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH ELI BERTRAND, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Thread-Controlling Mechanism for Sewing-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to thread-controlling mechanism for sewing-machines, is a division of my application, Serial No. 704,812, filed February 7, 1899, and is an improvement upon the invention described and illustrated in Patent No. 618,372, granted to me January 24, 1899; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a side elevation of a lock-stitch sewing-machine, illustrating my invention. Fig. 2 is an elevation of the opposite side of so much of the machine as is necessary to illustrate my improved thread-controlling mechanism, drawn to an enlarged scale. Fig. 3 is a sectional plan of the same parts that are shown in Fig. 2. Fig. 4 is an elevation of the vertically-movable sheave and its carrier to be adjustably mounted in a bearing in the rear extension of the awl-operating lever. Fig. 5 is an enlarged sectional view of the thread-guiding sheave provided with ratchet-teeth to be engaged by a stop-pawl, as will be hereinafter described.

In the drawings, A is the base-plate of the frame of the head of the machine, provided with the upwardly-projecting plate-like stand-ard A' and firmly secured to a suitable supporting-column B of any suitable construction. The base-plate A has set therein two columns in bearings, in the upper end of which is mounted the shaft C, one only, A<sup>4</sup>, of said columns being shown in the drawings. The shaft C has firmly secured thereon the necessary cams for operating the several moving parts of the machine, substantially as shown and described in the before-cited application.

D is the feed-slide, to which a reciprocating motion is imparted by means of the cam C<sup>3</sup> and the lever C<sup>5</sup>, as in said prior application.

All parts of the machine not referred to by reference-letter or not shown in the accompanying drawings are constructed, arranged, and operated as in said prior application.

E' is the work-support, and E<sup>2</sup> its pivoted carrier. E<sup>3</sup> is the thread-controlling reciprocating bar connected to and movable endwise by the variable movements of the work-support when work of varying thickness is fed between the presser-foot d' and the work-support.

F is the locking-lever, constructed, arranged, and operating precisely as in the before-cited prior patent except that the arrangement of the spring g' for holding its rear arm or the truck i<sup>2</sup>, carried thereby, in contact with the cam i<sup>3</sup> is located below the pin h, has its lower end connected directly to said lever F, and its upper end to the rod g<sup>3</sup>, which is threaded to receive the adjusting-nut g<sup>4</sup> above the pin h, in which said rod g<sup>3</sup> has its bearing.

J is a bracket bolted to the under side of the flange of the column B and projecting to the rear thereof to serve as a support for the wax-pot, which with the rear portion of said bracket is not shown. A smaller bracket J' is bolted to the bracket J and has mounted therein the spindle o<sup>2</sup>, upon which is mounted the tension-wheel J<sup>2</sup>, the pressure-disk o<sup>3</sup>, the spring o<sup>4</sup>, and spring compressing or adjusting nut o<sup>5</sup>, all of well-known construction.

K is a lever fulcrumed upon the same stud j upon which the awl-operating lever D<sup>3</sup> is mounted, but upon the opposite side of the stand H from said lever D<sup>3</sup>, and has a vibratory motion imparted thereto by a suitable cam, (not shown, but precisely as in said prior patent.) The rear end of said lever K has secured thereto the plate q<sup>2</sup>, which when depressed serves as a brake-shoe to press upon the thread Q within the groove of the tension-wheel to prevent the thread being drawn therefrom when the shuttle is passing through the loop and when the stitch is being set. The lever D<sup>3</sup> has a short rearwardly-projecting



arm, in the rear end of which is adjustably secured the pendent thread-engaging arm  $r$ .

So far as now described the machine is constructed and operates as in said prior patent 5 except as will be now described.

The pendent rod  $r$  is provided at its lower end with the enlarged forked portion  $r'$  and has mounted between its two arms the anti-friction-sheave  $r^2$ , the groove in which engages 10 the thread when the rear end of the lever  $D^3$  is depressed, the lower end of each arm of said fork  $r'$  being provided with an inwardly-projecting lug or shoulder  $r^3$  with its inner face inclined outward, as shown, which serves to 15 guide the thread to the sheave and prevent all possibility of the thread getting between said sheave and its supporting-arms.

In the machine described in said prior patent the bar  $E^3$  was provided with a rearward 20 extension formed integral therewith or firmly secured thereto, upon the rear end of which was mounted a thread-guiding sheave which was moved toward and from the tension-wheel according as the thickness of the sole 25 fed between the presser-foot and the work-support varied and caused a movement of the work-support and its carrier at the same time that the thread-measuring finger descended between said sheave and the tension-wheel to 30 draw from said tension-wheel the requisite amount of thread for the next stitch, said thread-guiding sheave being prevented from being rotated backward, as will presently appear. While this device as constructed in 35 said prior patent did vary the amount of thread drawn from the tension-wheel and source of supply as the position of the work-support varied, it was found that it did not deliver quite the desired amount of thread, 40 and to obviate this objection I mount upon the hub of the stand  $H$ , in which is set the stud  $j$ , the triangular arm  $L$ , having set in its rear end the stud  $r^4$ , upon which is mounted the sheave  $r^5$ , having a V-shaped groove, the 45 inner portion of which has parallel sides, the distance between which is not greater than the diameter of the thread to be used. The sheave  $r^5$  has formed upon its periphery, at one side of its groove, a series of ratchet-teeth 50 with which the pawl  $r^6$  engages to prevent backward rotation of said sheave when the sheave  $r^3$  descends upon the thread and depresses it between said sheave  $r^5$  and the tension-wheel.

$L'$  is a link pivoted at one end to the lower corner of the triangular arm  $L$  and at its other end to the rear end of the bar  $E^3$ , as shown in Fig. 2.

$M$  is the shuttle;  $M'$ , the shuttle-race, which, 60 with the devices for operating the shuttle, are constructed, arranged, and operated as shown and described in the before-cited application.

The thread  $Q$  after leaving the wax-pot (not shown) passes to and once around the tension-wheel  $J^2$ , thence to and once around the sheave 65  $r^5$ , thence over and under the sheaves on the arm  $R$  at the front of the machine, then

through the eye of the looper, (not shown,) and thence to the work precisely as in said cited prior patent. 70

The operation of my invention is as follows: If a piece of work of varying thickness is being sewed and the thin part is between the work-support and presser-foot and the thicker 75 part is fed beneath the presser-foot, the work-support is depressed, the bar  $E^3$  is moved toward the rear, the locking-lever being raised from contact therewith by the action of the cam  $i^3$  upon the truck  $i^2$ , and the arm  $L$  is moved about its axis of motion in the direc- 80 tion indicated by the arrow on Fig. 2, carrying the sheave  $r^5$  upward at the same time that the sheave  $r^2$  descends and carries downward a bight of the thread  $Q$ , thus increasing the length of thread drawn from the tension- 85 wheel to correspond with the increased thickness of the work resting upon the work-support. If the work is fed from a thick to a thinner portion, the reverse action takes place and a less amount of thread is drawn from the 90 tension-wheel, the sheave  $r^5$  being prevented from turning backward while the sheave  $r^2$  is drawing the thread from the tension-wheel by the stop-pawl  $r^6$ , as before described.

What I claim as new, and desire to secure 95 by Letters Patent of the United States, is—

1. In a lock-stitch waxed-thread sewing-machine, the combination with a stitch-forming mechanism, of a yielding work-support; the bar  $E^3$  connected thereto and movable 100 thereby; means for locking said bar and work-support; a friction tension-wheel; the pivoted arm  $L$  located between said tension-wheel and work-support; the link  $L'$  connecting the arm  $L$  and bar  $E^3$ ; the thread-guiding sheave  $r^5$  105 carried by the said arm  $L$ ; the stop-pawl  $r^6$ ; the vertically-movable thread-depressing sheave  $r^2$ ; and means for imparting to said sheave  $r^2$  intermittent downward and upward movements. 110

2. In a lock-stitch sewing-machine, the combination with a stitch-forming mechanism, of a yielding work-support; the bar  $E^3$  connected thereto and movable thereby; means for locking said bar and work-support; a frictional 115 tension-wheel; a brake-shoe for intermittently clamping the thread on said tension-wheel; means for intermittently depressing and raising said brake-shoe; the pivoted arm  $L$ ; the link  $L'$  connecting said arm  $L$  and the 120 bar  $E$ , a thread-guiding sheave mounted on said arm  $L$  in near proximity to said tension-wheel but between it and the work-support, and freely revoluble in a forward direction; means for locking said sheave against back- 125 ward revolution; a vertically-movable thread-depressing anti-friction-sheave; a forked housing for said sheave the lower end of each fork of which is provided with inwardly-projecting guard-lug as set forth and means for inter- 130 mittently actuating said thread-depressing sheave.

3. In a lock-stitch waxed-thread sewing-machine, the combination of a pivoted yield-



ing work-support; means for locking said  
work-support; a frictional tension-wheel; a  
brake-shoe to engage the thread on said ten-  
sion-wheel; means for intermittently vibrat-  
5 ing said brake shoe; a pivoted arm arranged  
between said tension-wheel and the work-sup-  
port with its rear movable end in near prox-  
imity to said tension-wheel; a thread-guiding  
sheave mounted upon the rear end of said arm  
10 and having a V-shaped peripheral groove;  
means for preventing a backward revolution  
of said sheave; an intermittent vertically-  
movable thread-depressing sheave arranged  
between said tension-wheel and thread-guid-

ing sheave means for intermittently actuat- 15  
ing said depressing-sheave; and means con-  
necting said pivoted sheave-carrying arm and  
the work-support, whereby a downward move-  
ment of said work-support will cause an up-  
ward movement of said thread-guiding sheave. 20

In testimony whereof I have signed my  
name to this specification, in the presence of  
two subscribing witnesses, on this 26th day  
of May, A. D. 1899.

JOSEPH E. BERTRAND.

Witnesses:

N. C. LOMBARD,

L. I. LA CHAPELLE.