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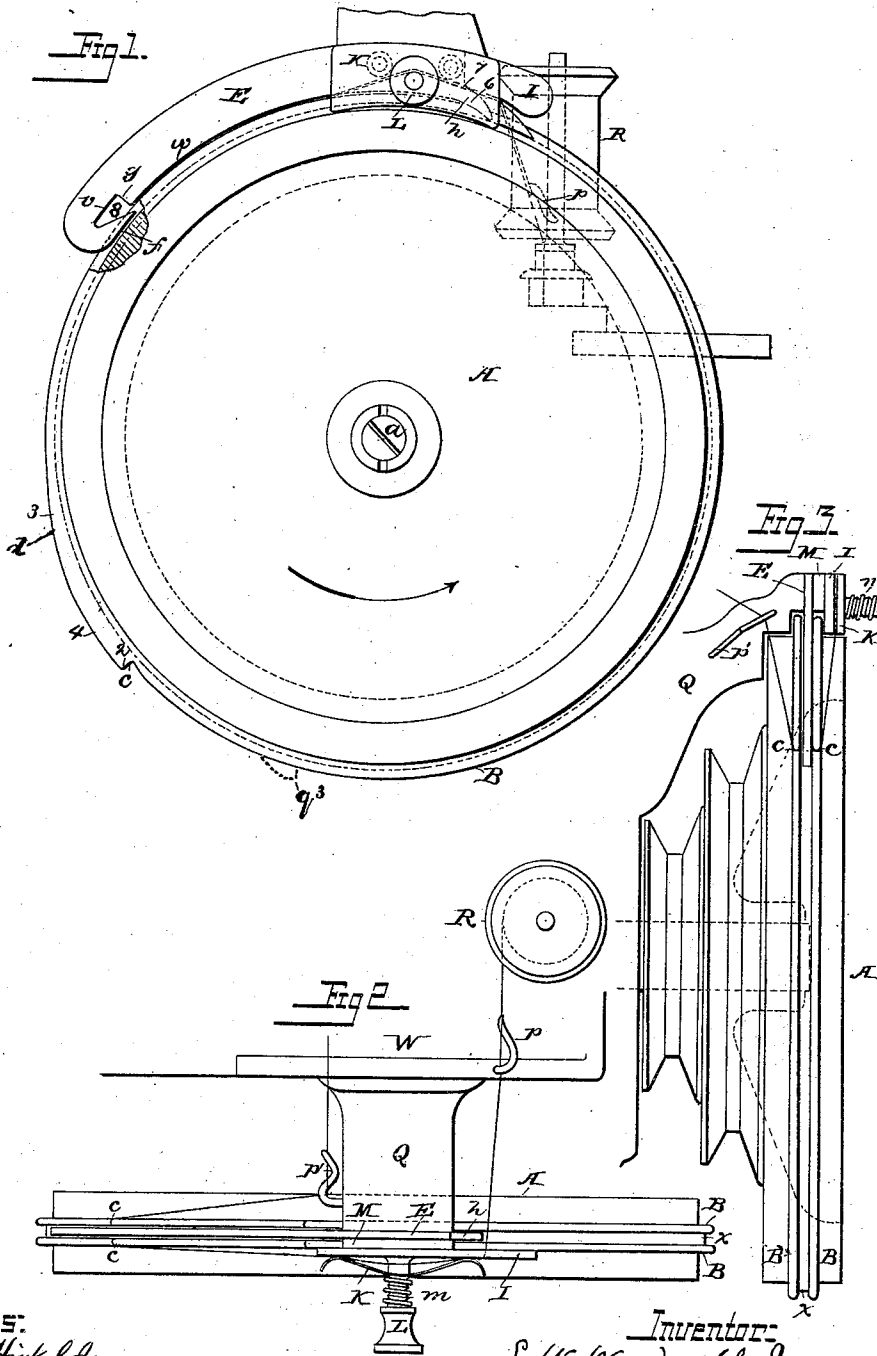
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S. W. WARDWELL, Jr.

ROTARY TAKE-UP FOR SEWING MACHINES.

No. 357,251.

Patented Feb. 8, 1887.



Attests:
 John G. Hinkel
 Wm. A. Harris

Inventor:
 S. W. Wardwell Jr
 By Foster & Freeman
 Atty

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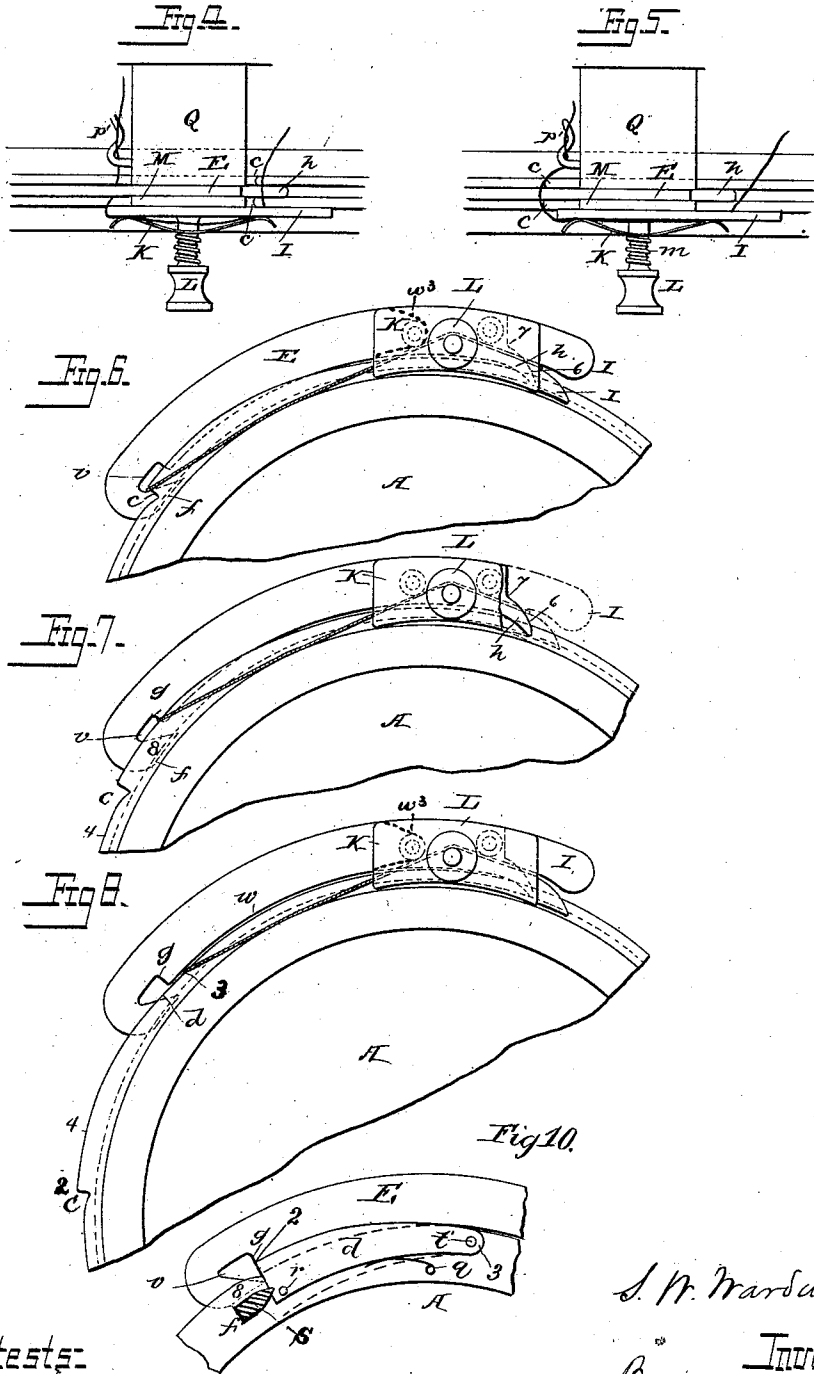
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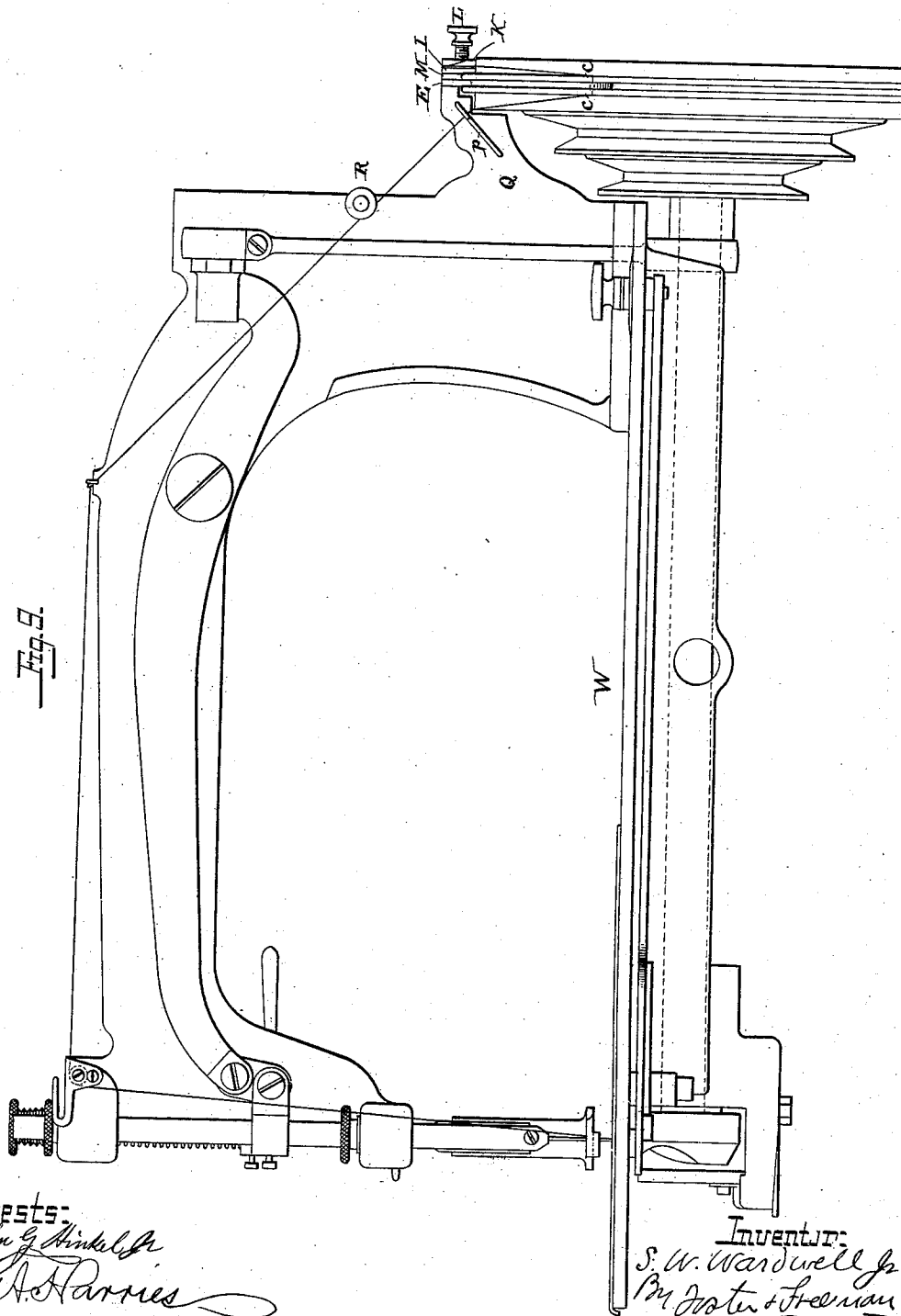


Fig. 3.

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UNITED STATES PATENT OFFICE.

SIMON W. WARDWELL, JR., OF WOONSOCKET, RHODE ISLAND, ASSIGNOR
TO WILLIAM P. EARLE, TRUSTEE, OF BROOKLYN, NEW YORK.

ROTARY TAKE-UP FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 357,251, dated February 8, 1887.

Application filed January 7, 1886. Serial No. 167,907. (No model.)

To all whom it may concern:

Be it known that I, SIMON W. WARDWELL, Jr., a citizen of the United States, and a resident of Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Take-Ups for Sewing-Machines, of which the following is a specification.

My invention has for its object to provide a take-up device especially adapted for use with machines running at high rates of speed; and my invention consists of a take-up device in which the take-up function is performed by a rotary traveling shoulder, on which the needle-thread is held by a retaining-bar until the bobbin-loop has been drawn up, the stitch tightened, and sufficient thread drawn from the spool for a new stitch, and in which, when the device is used for machines running at very high speeds, a preliminary drawing of the thread is effected, all as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is a face view illustrating one construction in which my invention may be embodied. Fig. 2 is a plan of Fig. 1, illustrating the parts in a different position. Fig. 3 is an edge view of Fig. 2; Figs. 4 and 5, detached plan views; and Figs. 6, 7, and 8, detached face views, illustrating the operation of the device. Fig. 9 is a side elevation of a sewing-machine with my improved take-up device combined with the balance-wheel thereof; Fig. 10, a view illustrating a modification.

In the construction illustrated in Figs. 1 to 9 there is a wheel, A, mounted upon a shaft, *a*, the said wheel being arranged upon the sewing-machine in any suitable position. I prefer, however, to arrange it as shown in Fig. 9, so that the wheel A serves not only as the take-up wheel but as the driving and balance wheel of the machine.

Upon the wheel, preferably at the periphery thereof, is a flange, or, as shown, there are two flanges, B B, forming annular ribs, which ribs are of uniform height, except between the points 2 3, where they are higher than elsewhere, forming on each a shoulder, *c*, and an inclined face, *d*, extending from the point 2 to

the curved edge 4 of the more elevated portion of the ribs, adjacent to the shoulder *c*.

At a point above the channel *x*, between the ribs, is arranged in a fixed position a plate or bar, E, which I term a "retaining-bar," the lower or inner edge, *w*, of which is curved to correspond to the curve of the edges of the flanges B, but is arranged at a slight distance therefrom, sufficient to permit the passage of a thread, as set forth hereinafter.

An extension from the rear end of the retaining-bar E projects inward below the edges of the flanges, and is formed to constitute what I term a "slacking-toe," *h*, having an inclined edge, 6, leading upward to a point, 7, on the heel of the bar E, and at the forward end of the said bar a projection extends inward, forming a cast-off toe, *f*, having an inclined edge, 8, leading upward into a notch, *v*, forming a shoulder, *g*.

A plate, I, is suspended in a fixed position outside of the outer flange, B, and against this plate bears a tension-spring plate, K, held in position by a screw, L, extending into the tension-plate I, and by a spring, *m*, coiled around the screw and bearing upon a shoulder thereof and upon the tension-spring plate K, these parts, as well as the retaining-bar E, being, in the construction shown, all supported by an arm, Q, extending from the bed of the sewing-machine over the top of the wheel A, a distance-plate, M, separating the retaining-bar E and the tension-plate I.

The thread is conducted from a spool or bobbin, R, arranged in any suitable position, through a guide or eye, *p*, over the flanges B, adjacent to the heel of the retaining-bar E, through a slot in the plate I, between the tension-plate I and tension-spring plate K, above the screw L, and, as shown in Fig. 9, across the forward edge of the plate I, between the contiguous edges of the retaining-bar and the flanges B, and then through an eye or guide, *p'*, forward to the needle.

The screw L is turned so as to secure such a pressure of the spring-plate K upon the tension-plate I as will impart the proper tension to the thread, and, the parts being in the position shown in Fig. 1, the needle is threaded and sufficient thread is drawn by hand through

the tension device and thread-guides to form the first loop that passes over the bobbin. Rotation then being imparted to the wheel A in the direction of its arrow, the operations will be as follows: The shoulder *c* will first be brought against the thread where it crosses the flanges adjacent to the heel of the retaining-bar E, drawing a portion from the spool and carrying it forward and over the inclined edge *g* of the slackening-toe *h*, until the said inclined edge lifts the thread from the shoulder to a position above the projecting portion of the flanges, leaving it slack between the spool and tension device, as shown in Fig. 4. This preliminary slackening of the thread between the spool and tension device is of great importance when running at a high rate of speed, as the sudden resistance of the inertia of the spool, if added to the tensional friction, would be sufficient to draw the locks to the top of the material, (making a bad seam,) and at a very high rate of speed (as from three to four thousand revolutions per minute) to frequently break the thread. After the shoulder *c* has passed from contact with that portion of the thread between the spool and tension device, it is brought against the other transverse portion of the thread, extending between the tension device and needle over the flanges and beneath the retaining-bar, as shown in Fig. 5, and carries it forward until the shoulder *c* is opposite the notch *v* in the retaining-bar, as shown in Fig. 6, thus drawing up the bobbin-loop, tightening the stitch, and drawing sufficient thread for a new stitch, through the tension device, from the slack between the tension device and spool. The transverse portion of the thread will then ride over the inclined shoulder *s* of the cast-off toe *f*, and being thrown off the shoulder *c* will be caught upon the shoulder *g* of the notch *v*, as shown in Fig. 7, and held temporarily.

The loop of thread will be retained within the notch until the needle is ready to enter the cloth, the object being to prevent the thread from being thrown out of the guides by the elastic rebound from the sudden release from strain. When the projecting portion of the flanges has passed the notch and there is an open space between the flanges and the edge of the retaining-bar E, the thread will be carried into said space, as shown in Fig. 8, and will be drawn back by the forming of the bobbin-loop to the position shown in Figs. 1 and 4, after which the above-described operations will be repeated in the same order.

It will be seen that all the parts above described operate positively to slacken, draw out, and release the thread; that there are no reflex motions except of the thread itself, so that the parts can be operated with great rapidity; that there is but little friction upon the thread by the take-up devices, the only frictional action resulting from the passage of the thread across the shoulder *c*, where a roller may be inserted, if desired, and that the op-

eration is noiseless, there being no loose or moving parts, except the wheel A, and consequently no contacting devices.

Instead of two flanges, there may be but one, and the flanges may be upon the periphery or at the side of the wheel, the form of the retaining-bar being correspondingly varied; and I do not limit myself to the use of the shoulder *c* for imparting the initial movement to the portion of thread between the spool and tension device and for preliminarily slackening the said portion and for drawing the thread from the spool, as a separate shoulder or arm, *q*, Fig. 1, dotted lines, may be arranged to strike this portion of the thread, and the thread, instead of being disengaged from the said shoulder or arm, or from the shoulder *c*, by raising the thread outward, may be disconnected by drawing the shoulder inward, in which case the part upon which the shoulder is formed must be movable. For instance, in Fig. 10 the portion of the flange B between the points 2 3 is pivoted at *t*, so that it may be drawn down to the position shown in dotted lines, Fig. 10, by a cam, *n*, arranged to strike the pin *r* upon the side of the movable portion, a spring, *g*, throwing said portion outward, the retaining-bar preventing the thread from being thrown outward from the retaining-shoulder by the centrifugal action resulting from the high speed at which the shoulder travels. It will be evident that other forms of cast-off or detaching means may be employed.

Any suitable tension device may be substituted for that shown, and instead of providing the flanges B with a projecting or elevated portion behind the shoulder *c*, they may be of uniform height, in which case the bar E, instead of being fixed, should be pivoted at *w*, as shown in Figs. 6 and 8, so as to normally occupy an inward position, with its lower edge below the outer edge of the flanges, and be lifted whenever the thread is to escape from the shoulder *g* and move back to the position shown in Fig. 8.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. A take-up device for sewing-machines, consisting of a rotating wheel provided with a shoulder, guides arranged to conduct the thread from the spool to a position to be struck by the said shoulder, that it may be carried therewith, means, substantially as described, for detaching the thread from the shoulder, and a bar arranged to hold the thread in position upon the shoulder until it is detached therefrom, all substantially as set forth.

2. The combination of the rotating wheel, provided with a shoulder for catching the thread, a thread-slackening device, and a bar arranged adjacent to the path of the shoulder so that its edge will be traversed by the thread carried by the shoulder, a detaching device whereby the thread is disengaged from the

said shoulder, and a retaining-shoulder, *g*, for holding the thread temporarily after it has been detached, substantially as and for the purpose set forth.

5 3. The combination of a rotating wheel, a shoulder thereon, a tension device, and guides arranged, as described, at opposite sides of the path of the shoulder, and one forward of the other; to conduct a thread across the path of
10 the shoulder at separate points from a spool to said tension device and from the latter to a needle, and releasing means, substantially as described, to detach the thread from the shoulder after it is caught thereby at opposite ends
15 of the tension device, as and for the purpose set forth.

4. The combination, in a thread take up, of a thread-supporting spool, a tension device, and a traveling shoulder between said spool
20 and tension device, with guides to place a thread in the track of and in contact with said shoulder and a releasing device to disconnect said thread from said shoulder, whereby the thread is left slack between the spool and tension device prior to the drawing up of the bobbin-
25 loop by said take-up, as and for the purpose set forth.

5. In combination, in a rotating take-up, a thread-supply, a traveling shoulder, a tension
30 device, and thread-supporting guides on opposite sides of the path of the shoulder, the said traveling shoulder engaging the thread intermediate the supply and tension device, as set forth.

35 -6. The combination, with a traveling shoulder, thread-conducting guides, and means to conduct a thread back and forth in the path of said shoulder, of means for disconnecting one portion of said thread from the shoulder
40 before the other portion is caught thereby, and a second means for disconnecting said latter portion from the shoulder, substantially as described.

7. The combination of the traveling shoulder,
45 a tension device, guides conducting the thread to and from the tension device across the path of the shoulder, and disconnecting means at opposite sides of the tension device, substantially as set forth.

50 8. The combination of a traveling shoulder, tension device, guides conducting the thread to and from the tension device in the path of the shoulder and a bar arranged to hold the thread to the shoulder and cast-off devices at
55 opposite ends of the bar, substantially as set forth.

9. The combination, in a take-up device, of a wheel provided with one or more flanges, with projecting portions and with shoulders,
60 a bar arranged to leave a slight space between

its inner edge and the edges of the flanges, a tension device and guides directing the thread across the flanges to and from the tension device, and detaching devices arranged to dis-
65 connect the thread from the shoulders at each side of the tension device, substantially as set forth.

10. The combination of the wheel having flanges with projections and shoulders, a tension device and guides, a retaining-bar, and
70 detaching devices consisting of toes with inclined edges, and a shoulder, *g*, substantially as described.

11. The combination of the wheel having flanges with projections and shoulders, tension
75 device, and guides, and retaining-bar having a shoulder, *g*, and notch *v*, and detaching-toes with inclined edges, substantially as set forth.

12. The combination, with the balance-
80 wheel of a sewing-machine, of a tension device and thread-guides, a shoulder upon said wheel arranged to make contact with the thread, and detaching devices whereby said thread is detached from the shoulder at oppo-
85 site sides of the tension device, substantially as set forth.

13. The combination, in a sewing-machine, of a balance-wheel, tension device carried by an arm extending above the wheel, thread-
90 guides directing the thread to and from the tension device across the face of the wheel, a shoulder on the wheel adapted to catch the thread on each side of the tension device, and means for detaching the thread upon each side
95 of the tension device, substantially as set forth.

14. The combination of the wheel having parallel shouldered flanges, a retaining-bar
100 arranged adjacent to the said flanges and provided with a notch, shoulder, and cast-off toes extending between the flanges, and a tension device arranged between the cast-off toes, substantially as set forth.

15. A traveling shoulder, thread-guides ar-
105 ranged adjacent to the path of said shoulder upon opposite sides thereof at two different points to support a thread crossing said path, and means, substantially as described, to cause said shoulder to successively engage and re-
110 lease the two cross portions of the thread, substantially as set forth.

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

SIMON W. WARDWELL, JR.

Witnesses:

JEFFERSON ALDRICH,
G. E. BISHOP.