

A. A. MERRITT.

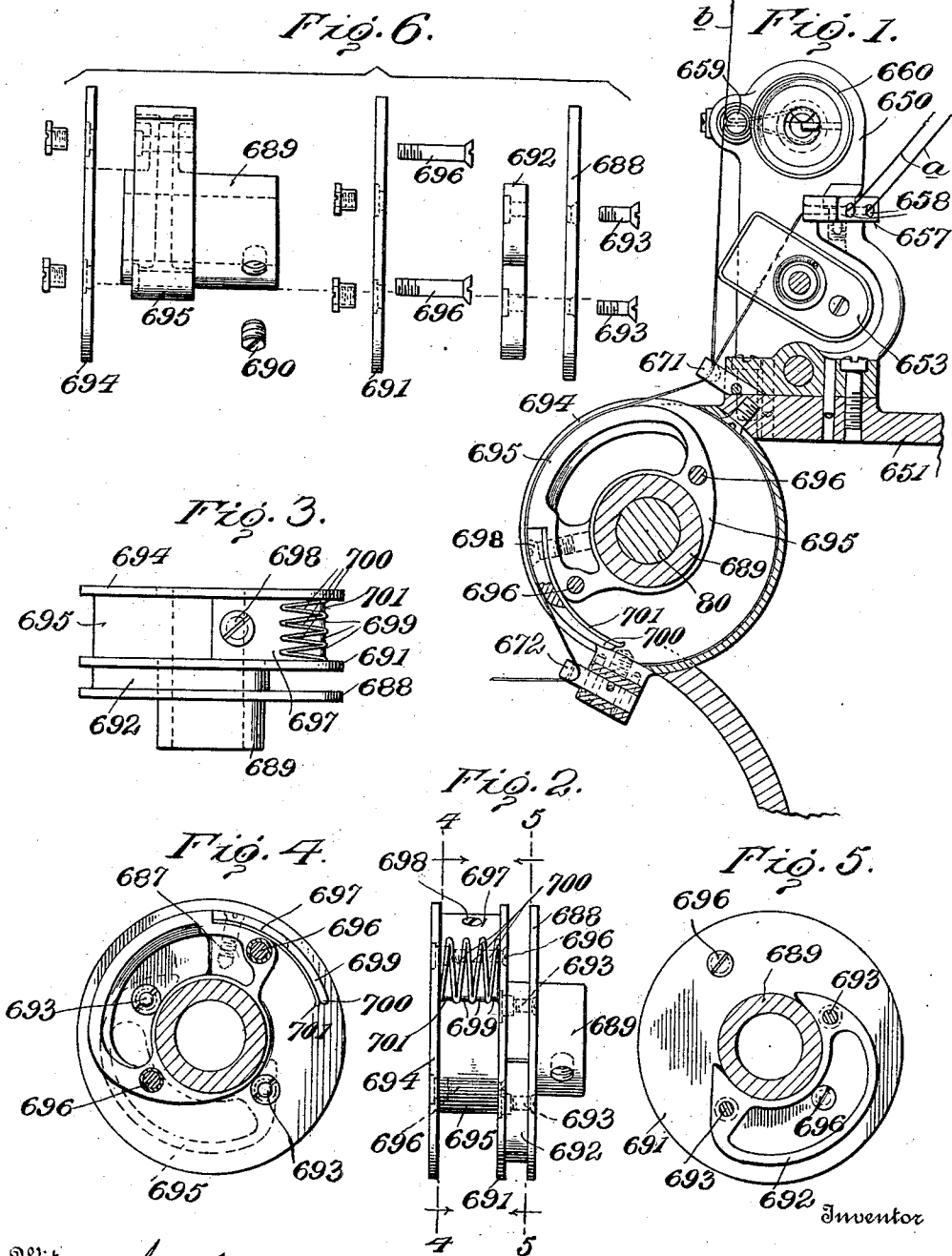
ROTARY TAKE-UP.

APPLICATION FILED JAN. 12, 1910. RENEWED AUG. 1, 1912.

1,041,715.

Patented Oct. 15, 1912.

2 SHEETS-SHEET 1.



Witnesses
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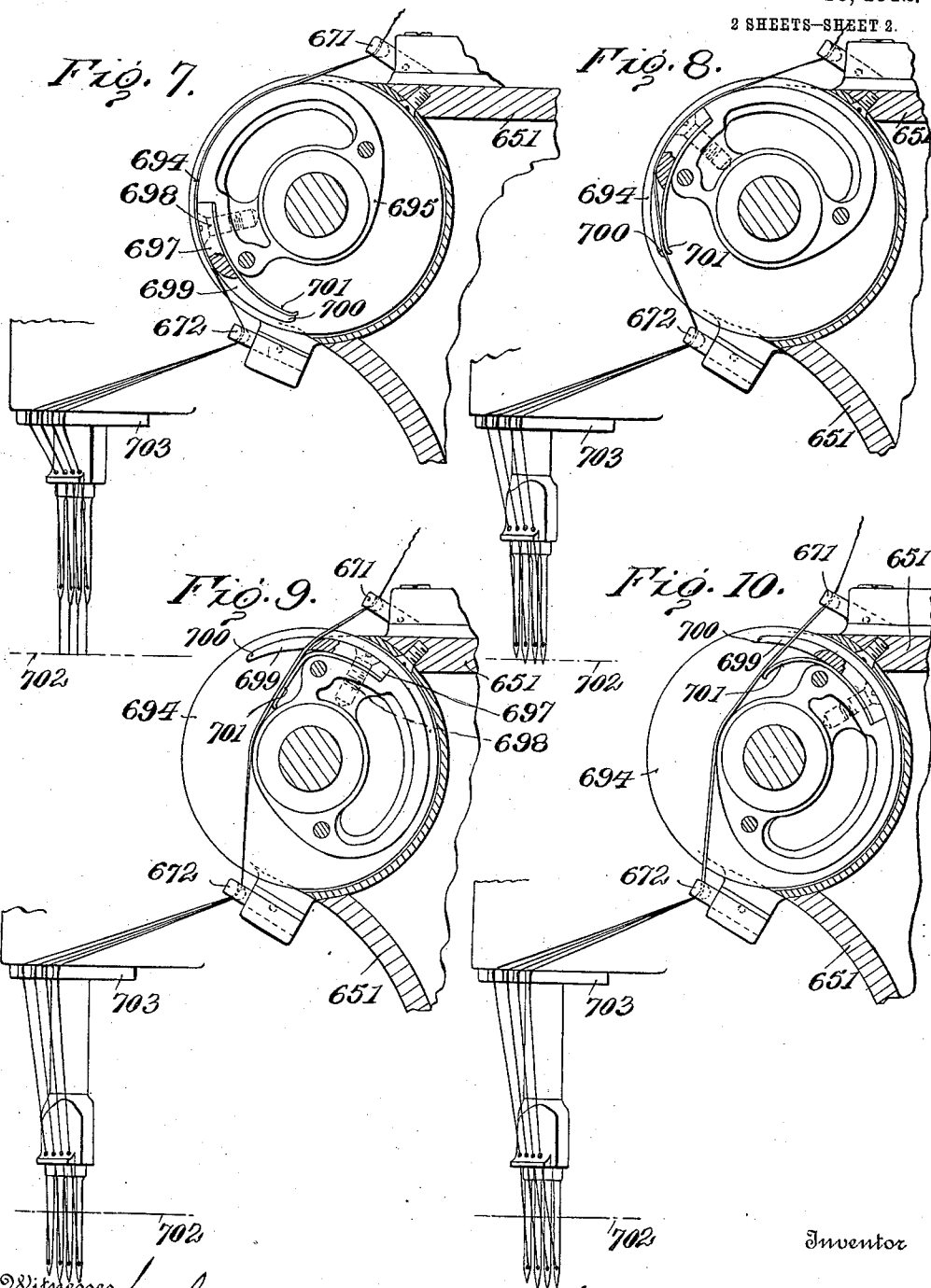
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Witnesses
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UNITED STATES PATENT OFFICE.

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ROTARY TAKE-UP.

1,041,715.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Original application filed December 12, 1908, Serial No. 467,163. Divided and this application filed January 12, 1910, Serial No. 537,685. Renewed August 1, 1912. Serial No. 712,776.

To all whom it may concern:

Be it known that I, ARTHUR A. MERRITT, of Worcester, Massachusetts, have invented a new and useful Improvement in Rotary Take-Ups, which invention is fully set forth in the following specification.

This is a division of my application filed December 12th, 1908, Serial No. 467,163, for improvements in sewing machines.

The present invention, which relates to improvements in take-ups, will be readily understood by reference to the illustration in the accompanying drawings of what was at the time of filing the aforesaid application regarded as the preferred embodiment thereof.

In said drawing, Figure 1 is a sectional view through a portion of a sewing machine including a take-up of the present invention; Figs. 2 to 5 are views of the take-up, Fig. 2 being a front elevation looking from the right in Fig. 4, Fig. 3 a plan view, Fig. 4 a section on line 4—4 of Fig. 2, and Fig. 5 a section on line 5—5 of Fig. 2; Fig. 6 shows the parts of the take-up separated; and Figs. 7 to 10 inclusive are a succession of views, each partly in section, showing relative positions of the take-up and the needles at different stages of the stitch-forming operation.

Figs. 1 and 7 to 10 illustrate the take-up of this invention as applied to a sewing machine of the character fully described and illustrated in the aforesaid original application of which the present is a division. 651 is a part of the bridge portion of the frame-work of such a machine. Fig. 1 shows a bracket or frame 650 secured to the upper surface of bridge 651 and supporting a thread-guide 659 and thread-tension disks 660. A single cross-thread *b* passes inward through the eye of thread-guide 659, around the spindle of tension disk 660 between said disks, outward through the eye of said thread-guide 659, downward to a set of thread-guiding hooks 671, over the take-up of the present invention, and thence to another set of thread-guiding hooks 672. The bracket 650 also supports a plate 657 having therethrough thread-passages 658, and a set of thread tension plates 653. The four needle threads *a*, only two of which are shown in Fig. 1, pass through the thread passages 658, between the tension-plates 653,

to the upper set of thread-guiding hooks 671, over the take-up, and thence to the lower set of thread-guiding hooks 672.

As illustrated herein, the present invention is embodied in a double take-up, one part for acting on the cross-thread *b* and the other part for acting on the four needle threads *a*. The needle-thread take-up cam-part 695 is integral with a hub 689, into which a set screw 690 is threaded securing it to the shaft 80. Around this hub side or flange-plates 691 and 688 are sleeved. Cross-thread cam-part 692 has an opening or recess which fits around hub 689. A flange plate 694 is also sleeved on the hub and screws 696, 696, passing through plate 691 and body part 695 are threaded into nuts which are set in countersunk openings through plate 694 and project therethrough into recesses in cam-part 695. Thus the plates 694 and 691 are firmly secured to cam-part 695. In like manner, screws 693 pass through plate 688 and cam-part 692 and engage with nuts which extend through countersunk openings in plate 691, and secure plate 688 and cam-part 692 to plate 691. There is thus provided at the bottom of the relatively narrow groove between the plates 688 and 691, a cam-like surface which acts upon the cross-thread drawn thereover. A curved plate 697 is secured at one end in a recess in cam-part 695 by a screw 698; its other end projects beyond the body part in the form of a series of tapered fingers 700 separated by four notches 699 for the four needle-threads respectively. A flat spring 701 is interposed and secured at one end between plate 697 and body part 695, and bears along and against the under side of fingers 700, its free end terminating at about the ends of the fingers. There is thus provided in the groove between the plates 691 and 694 an unyielding cam-like surface—the rigid surface of body part 695—and a yielding surface of spring 701, adapted to act upon the four needle-threads in the manner illustrated in Figs 7 to 10 inclusive. In this succession of views, the rotary take-up is shown in different positions corresponding to different operative positions of the needles. In each view the dotted line 702 indicates the approximate position of the upper surface of the throat-plate.

In Fig. 7, the needles are in their upper-

most position, about to begin a down-stroke, and the rotary take-up has exerted its maximum pull or pressure upon the threads to tighten the last stitch of each needle by taking up slack thread, and also to pull sufficient thread—in addition to the slack—through the tensions for the succeeding stitch. In Fig. 8 the needles have moved down the taut threads and their eyes are about to enter the work. The threads now extend through their respective notches 699, and the spring 701 is pressing outward against the threads, still holding the latter taut to prevent their becoming entangled with the needle points and the parts above the work-plate (shown in other figures of the drawings) which act upon the cross-thread. As the eyes of the needles pass through and below the work, the thread must be very rapidly supplied for formation of the needle loops below the work. This supply of thread is rendered possible by the pull on the thread bending the spring 701 inward toward the axis of rotation of the take-up to the limit of its movement, as shown in Fig. 9, the needle-thread in this position of the parts passing more nearly in a direct line between the thread-guiding hooks 671 and 672. In the position of the parts shown in Fig. 10, the needles are about to begin their ascending movement. It will thus be seen that the principal functions of the spring 701 are to retard the loosening of the threads after the unyielding part of the take-up passes its point of maximum pressure upon the threads, and to provide a continued pressure upon the threads which prevents slack but yields to supply thread to the formation of the loops while the needles project through the work.

What I claim is:

1. A rotary take-up having an unyielding part adapted to act upon the thread to take up the same, and a yielding part in the form of a spring adapted to press outward against the thread but to be bent inward toward the axis of rotation of the take-up by pull on the thread.

2. A rotary take-up having side plates

and a flat spring in the space between the plates adapted to press outward against the thread but to be bent inward toward the axis of rotation of the take-up by pull on the thread.

3. A rotary take-up having in its surface which contacts with the thread a cam-like part followed by a yielding portion constituting a continuation of said cam-like part.

4. A rotary take-up for simultaneously operating upon a plurality of threads having a cam-like part for acting upon the threads to take up the same, followed by one or more fingers with intervening slots, said fingers being adapted to project between and separate the threads, and yielding means under said slots adapted to be engaged by the threads passing through the slots and to yield to pull upon said threads.

5. A rotary take-up for simultaneously operating upon a plurality of threads having a cam-like part for acting upon the threads to take up the same, followed by one or more fingers extending beyond the cam-like part and separated by intervening slots, said fingers being adapted by the rotation of the take up to be projected between and separate the threads, and a flat spring extending from its fixed end along and in contact with the under surface of the fingers and under said slots and adapted to be engaged by the threads passing through the slots and to yield to pull upon said threads.

6. A rotary take-up for simultaneously operating upon a plurality of threads having one or more fingers with intervening slots, said fingers being adapted to project between and separate the threads, and yielding means under said slots adapted to be engaged by the threads passing through said slots and to yield to pull upon said threads.

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

ARTHUR A. MERRITT.

Witnesses:

H. A. W. HAYWARD,
BURTON V. MORSE.