R. G. WOODWARD.

THREAD CONTROLLING DEVICE FOR SEWING MACHINES.

APPLICATION FILED JULY 23, 1902.

908,434.

Patented Dec. 29, 1908.

3 SHEETS—SHEET 1.

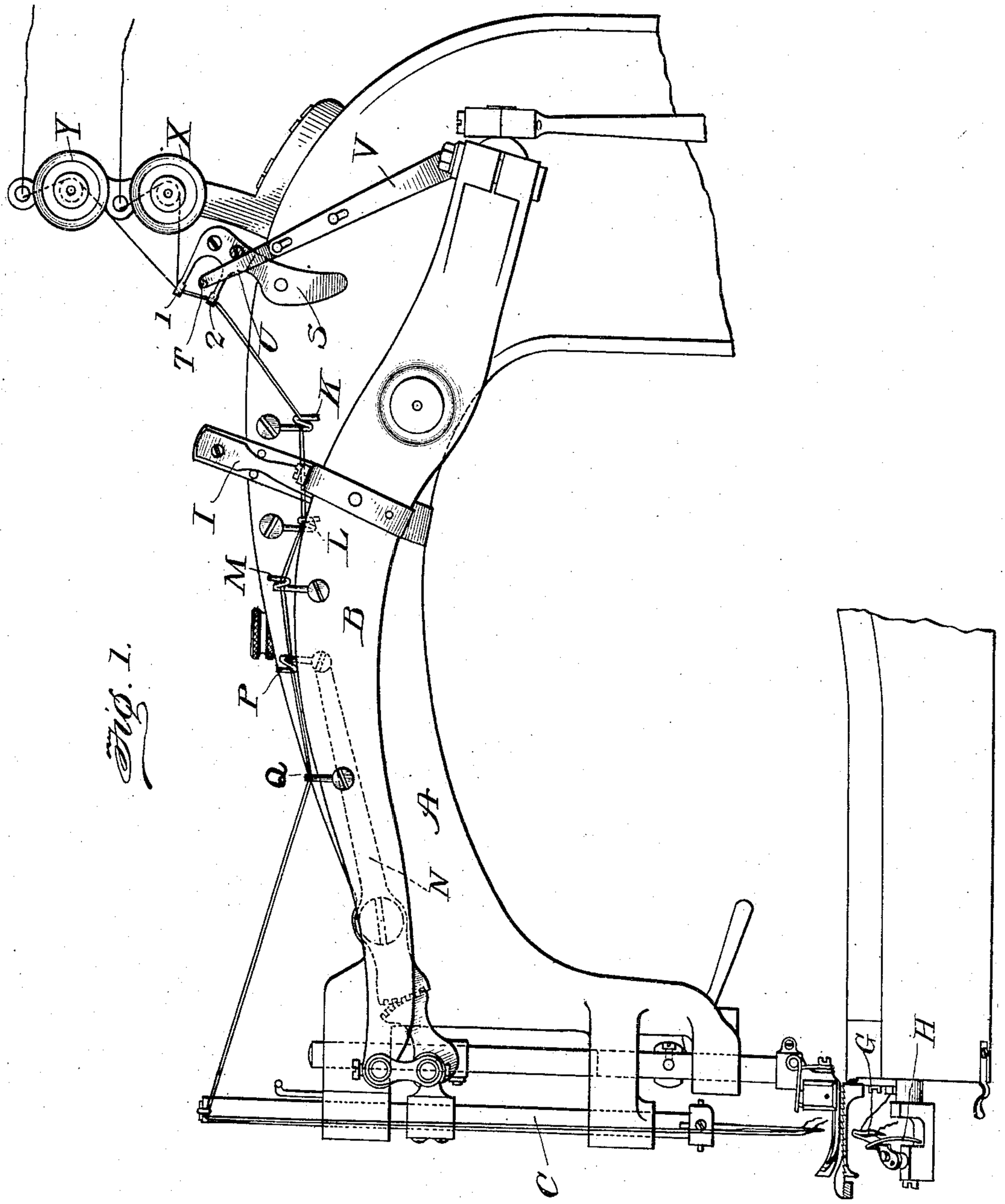

Fig. 1.

Witnesses

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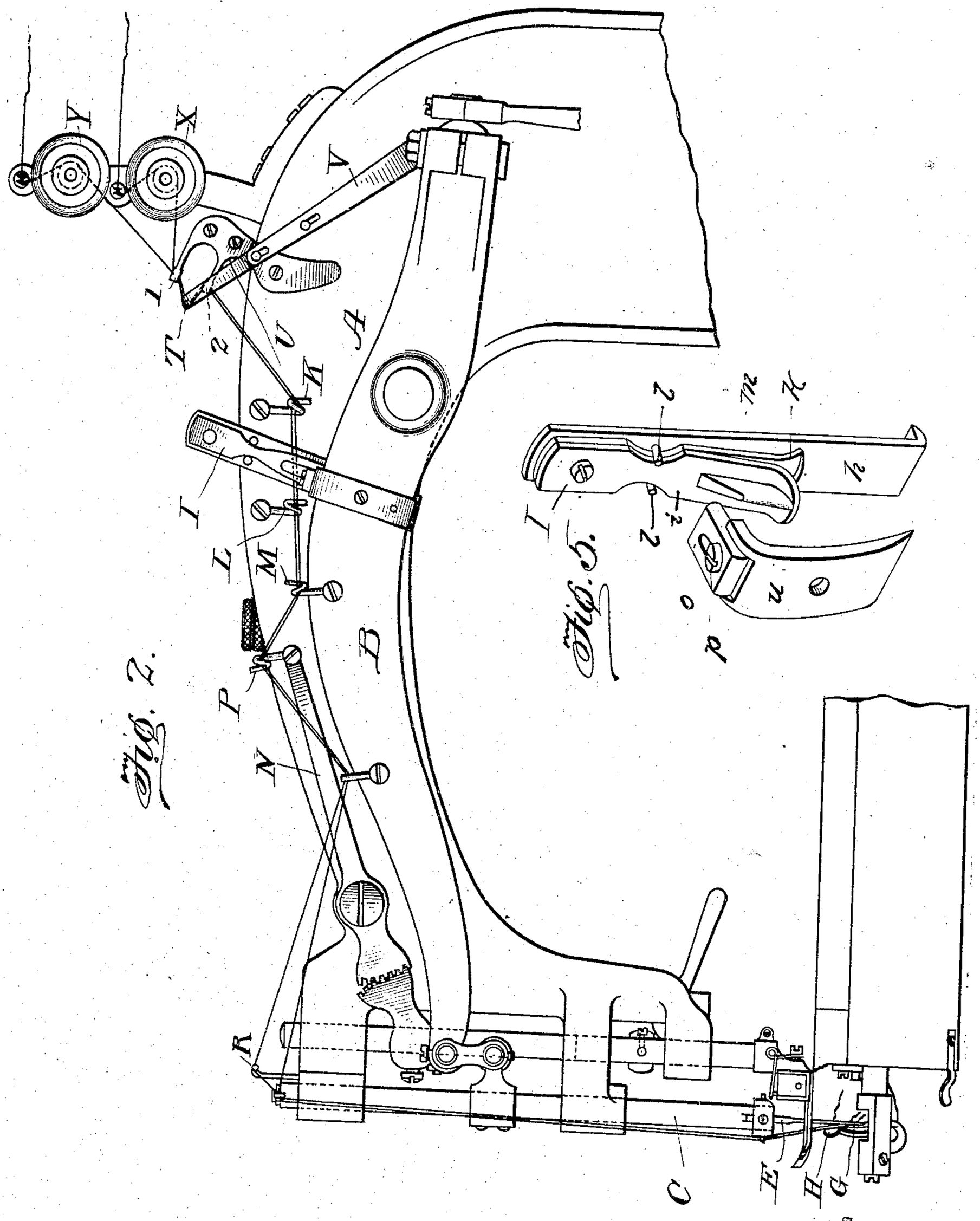

Fig. 2.

Fig. 3.

Witnesses

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3 SHEETS—SHEET 3.

Fig. 3.

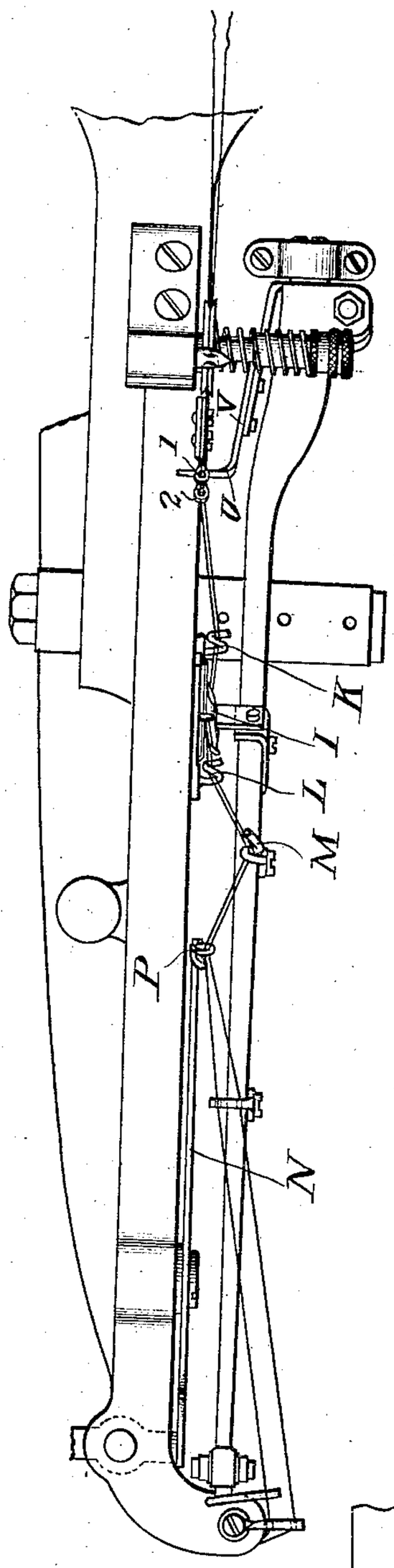
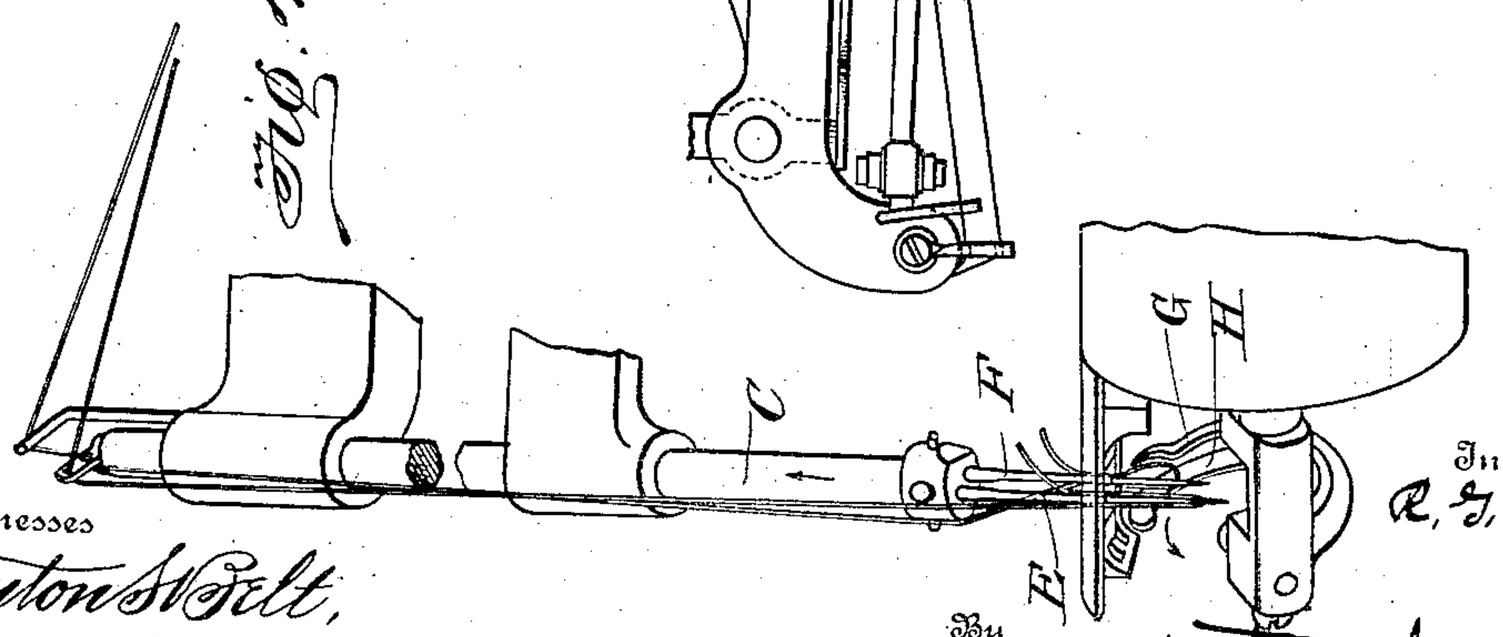


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

RUSSEL G. WOODWARD, OF WAUKEGAN, ILLINOIS, ASSIGNOR TO UNION SPECIAL SEWING MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

THREAD-CONTROLLING DEVICE FOR SEWING-MACHINES.

No. 908,434. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed July 23, 1902. Serial No. 116,625.

To all whom it may concern:

Be it known that I, RUSSEL G. WOODWARD, a citizen of the United States, residing at Waukegan, in the county of Lake, State of Illinois, have invented certain new and useful Improvements in Thread-Controlling Devices for Sewing-Machines, of which the following is a description, reference being had to the accompanying drawing, and to the letters and figures of reference marked thereon.

My invention relates to an improvement in sewing machines, and particularly to devices for controlling the thread upon a machine of the type known as the Union Special side wheel cylinder twin needle machine, for seam covering, which is illustrated in the patent granted L. Muther, E. C. Holland and myself, on the 12th day of May, 1897, No. 583,414. These machines are used quite extensively upon knit goods for covering seams previously made by superposing the edges of two pieces of fabric and joining them by a line of straight-away stitches, the fabrics being then spread out flat, and run through a sewing machine which embodies two needles and an under thread-carrying looper, the feed being arranged longitudinally of the bed plate, so that the seam made is covered, leaving practically no objectionable ridge, and presenting a highly finished and ornamental appearance. Difficulty has been experienced in machines of this character used for covering seams on light weight ribbed goods, from the fact that when the feed takes place at a time when the threads are not slack, a ridge or cord will be raised between the lines of needle puncture, which is, of course, objectionable in a garment.

The object of the present invention is to provide such an arrangement of controllers for the upper thread that the feed will take place while the needle threads are slack, thus avoiding all strain and the tendency to make a ridge on the goods along the lines of the seam.

The invention comprises in a sewing machine having stitch-forming mechanism of substantially the character described, a thread controller, and an intermittently acting nipping device for the thread, of a pull-off device acting on both the needle threads, this pull-off device being preferably composed of two parts which permit its being lengthened or shortened to pull off the desired amount of needle thread, there being also provided on a stationary part of the machine frame a pull up which acts upon the thread of the needle nearest the point of initial movement of the looper, this pull up acting to cause the thread of the needle upon which it acts to be thrown out into the form of a loop, before the loop is formed on the other needle, so that the stitches may be taken up at the proper respective times.

With this general statement of the features of the invention, it will be understood that said invention consists in the matters hereinafter described and referred to in the appended claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of so much of a sewing machine of the type referred to, as is necessary to a complete understanding of the invention, the parts being shown in the position they occupy while all the threads are slack and the feed is taking place; Fig. 2 is a similar view, showing the position of the parts when the needles have reached their lowest limit, and are about to recede to throw out the loops, the nipper springs being closed and the pull off having drawn the thread from the spools through the tensions, the pull up also acting to make the left hand needle thread substantially taut, so as to allow a loop to be thrown out before the right hand needle loop is thrown out; Fig. 3 is a top plan view, the parts being shown in the same relative position they occupy in Fig. 1; and Fig. 4 is a perspective end view of the parts illustrating the looper about in position to engage the left hand needle loop which has been thrown out ahead of the right hand needle loop by the action of the pull-up. Fig. 5 is a perspective view of the intermittent nipping device.

In these drawings, the usual operating parts of the machine are the same as illustrated in the patent above referred to, and need not be specifically mentioned, except to state that A represents the goose neck, B the needle lever, C the needle bar carrying the two needles, E, F, G, the looper carrying the looper guard finger H, I the nipping device which is constructed in a manner similar to that shown in an application filed by D. W. Corey, June 14th, 1901, No. 61,291, and K, L, M, are ordinary guiding eyelets for the thread; N, with its eyelet P representing the

portion of the usual Union Special thread controller connected with and operated by the presser guide bar. This intermittent nipping device is formed of a metallic plate *h* attached to the gooseneck by set screw *g*, and to the upper end of plate *h* are secured two spring plates *i*, *k*, held from lateral displacement by stop pins *l*, and normally separated at their lower ends to allow the thread to slip between them. The upper spring plate is formed adjacent its lower end, with a raised portion *m*. Upon the needle lever is secured the plate *u* having at its upper end a lug or projection *o*, adjustably secured by set screw *p*, and in the downward movement of the needle bar, the projection *o* will engage the spring plate *i* and force it into contact with plate *k*, thus gripping the thread.

Upon the needle lever B is arranged the eyelet Q having two openings for the passage of the needle threads, and a similar eyelet is arranged upon the upper end of the needle bar C. Upon the upper lug on the head of the machine is arranged a pull-up R which is arranged to act upon the left hand needle thread. Between the nipping device and the tension upon the goose neck of the machine is fixed a plate or arm S having two eyelets 1, 2, and between these two eyelets 1, 2, works a pull-off finger T, upon the end of the arm U adjustably secured to the arm V, which at its lower end is attached to the needle lever extension. As the needle lever moves up and down, therefore, the pull-off finger T alternately engages and releases the thread passing between the eyelets 1 and 2, thus alternately pulling off thread from the spools through the tensions X, Y, and releasing the same.

Assuming that the needles have passed their extreme upward position, and have commenced to move down, the feed has about ceased its forward movement, the nipper springs are closed, and the pull-off finger acts to draw thread through the tensions. When the needles have reached near the limit of their lower movement, the thread of the left hand needle is brought over the pull-up, and in the further downward movement of the needle some strain is put on said thread, which lasts during a portion of the upward movement of the needle, so that when the loop is thrown out a comparatively short one is thrown out, and this takes place before the loop on the longer, or right hand needle, is formed, so that by the time the looper reaches the left hand needle the loop is ready for it, the loops being thrown out successively instead of simultaneously, because of the action of the pull-up. The thread controller is preferably so adjusted that there is a little slack thread when the needles are at their lowest point. As the needles move out of the goods, and the feed begins to take place, the nipper springs release the threads, the pull-off recedes, and the threads are slack between the tensions, and the goods, so that the feed takes place without causing any strain upon the threads at all, and this prevents the formation of the objectionable ridge above referred to. By this machine seams can be covered on the lightest weight goods with practically no tendency to make a ridge or "cord up", and at the same time, the appearance on the under side of the seam or inside of the garment is not affected at all.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In a sewing machine for covering seams, including a plurality of needles and a cross stitch device coöperating therewith to lock the needle threads, means for controlling the needle threads including a pull-off and devices coöperating therewith, whereby thread is pulled off while the needles are descending and the thread is slack and free from strain, while the feed is taking place thus allowing a free feed for the material; substantially as described.

2. A sewing machine including in combination a needle, means for operating the same, a tension device, a thread nipping device intermediate said tension device and the needle and a pull off intermediate said thread nipping device and tension device, and means for operating said pull-off and thread nipping device whereby thread is drawn through said tension while the needle is descending and the needle thread is slack and free from strain while the feed is operating to feed the material; substantially as described.

3. In a sewing machine, including a reciprocating needle, means for controlling the thread thereof, comprising suitable eyelets for guiding the thread, an intermittent nipping device, suitable tensions, a pull-off between the nipping device and the tension and which acts to pull off thread while the needle is in the goods, and releases the thread while the feed is taking place, in combination with a pull-up acting upon the needle thread to take up the slack therein while the needle is moving down, to enable a loop to be quickly formed; substantially as described.

4. In a sewing machine comprising a plurality of reciprocating needles, means for controlling the threads thereof, comprising a pull-off acting to pull off thread while the needles are in the goods and releasing the same while the feed is taking place, and a pull-up acting upon one of the needle threads to cause it to throw out its loop in advance of the other; substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

RUSSEL G. WOODWARD.

Witnesses:

CHESTER MCNEIL,

EMMA KERN.