

No. 666,823.

Patented Jan. 29, 1901.

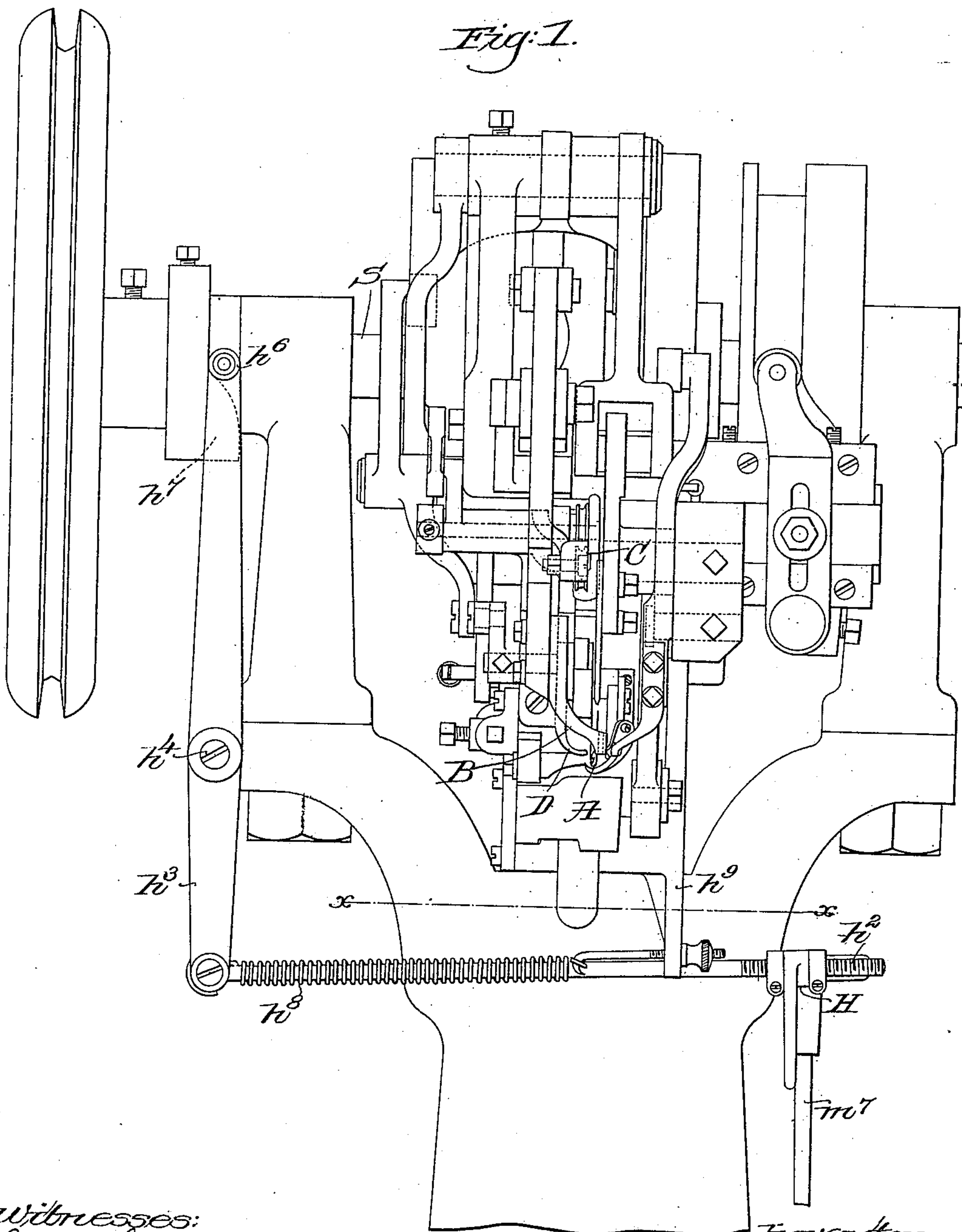
J. O. SELBY.

CHAIN STITCH SHOE SEWING MACHINE.

(Application filed May 7, 1900.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
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 by his Attorney
 Benjamin Phillips

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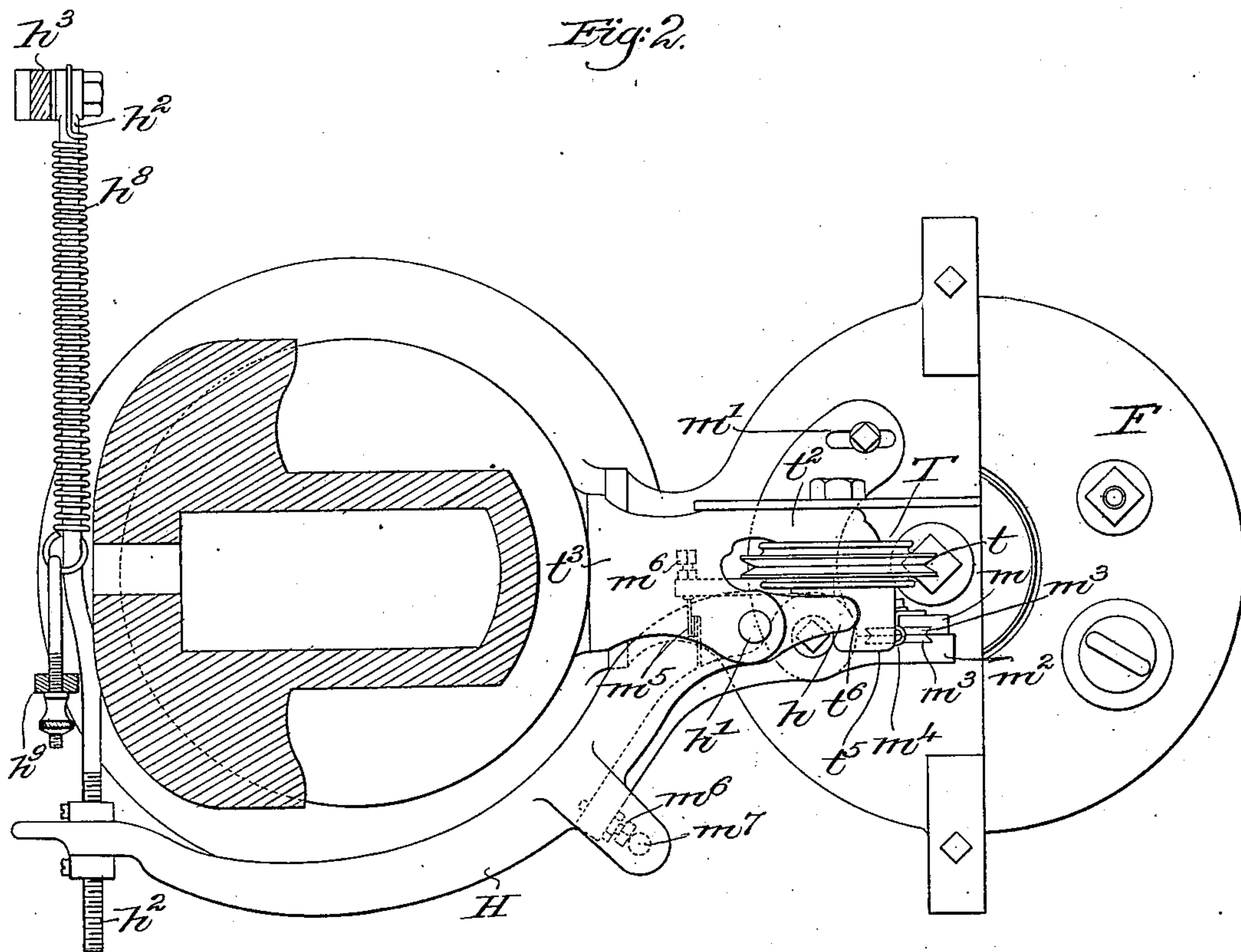
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(No Model.)

3 Sheets—Sheet 2.



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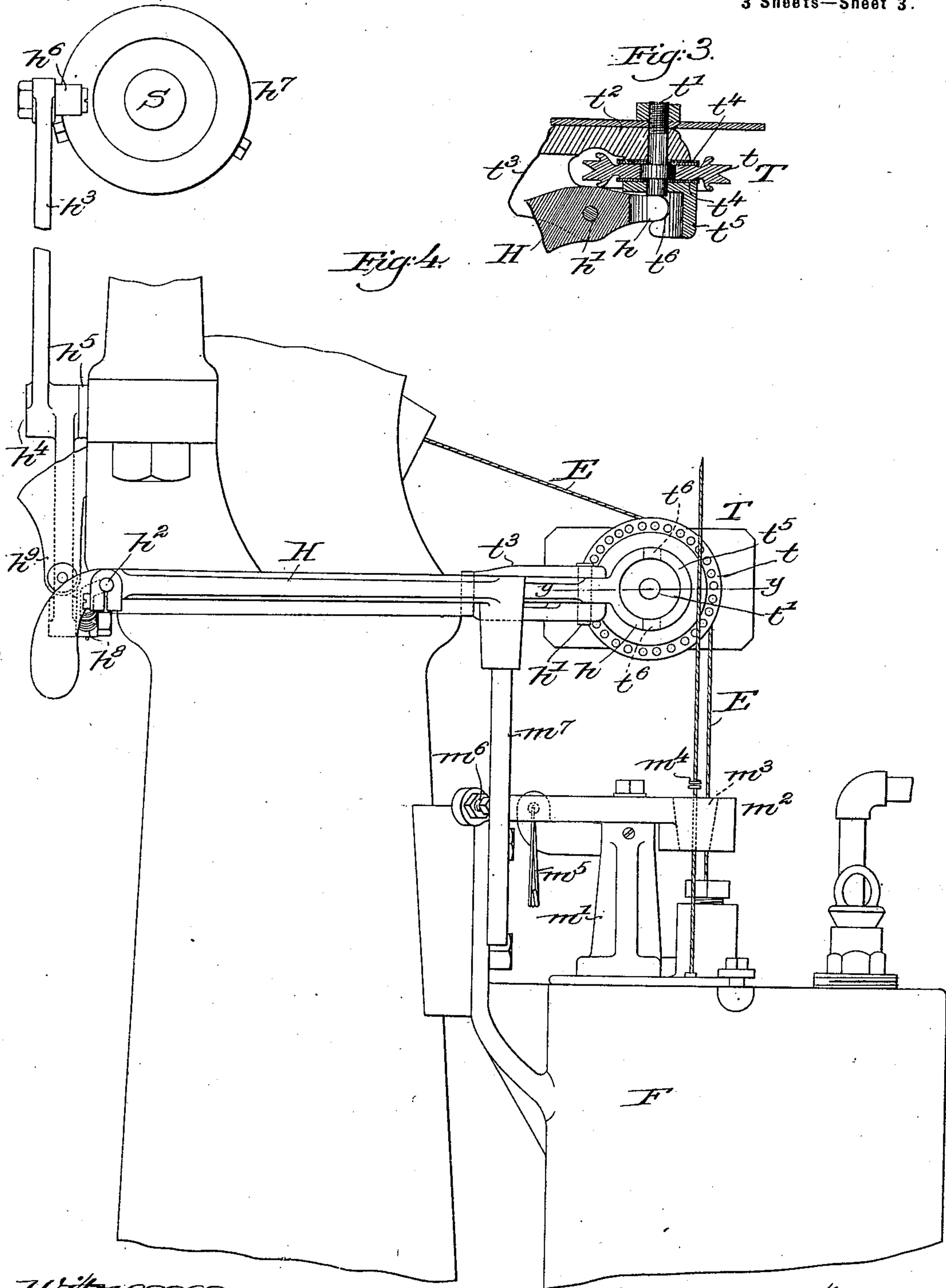
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CHAIN STITCH SHOE SEWING MACHINE.

(Application filed May 7, 1900.)

3 Sheets—Sheet 3.

(No Model.)



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UNITED STATES PATENT OFFICE.

JAMES OSCAR SELBY, OF PORTSMOUTH, OHIO, ASSIGNOR TO THE UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY.

CHAIN-STITCH SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 666,823, dated January 29, 1901.

Application filed May 7, 1900. Serial No. 15,690. (No model.)

To all whom it may concern:

Be it known that I, JAMES OSCAR SELBY, a citizen of the United States, residing at Portsmouth, in the county of Scioto and State of Ohio, have invented certain new and useful Improvements in Shoe-Sewing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates generally to improvements in shoe-sewing machines, and more particularly to improvements in that class of shoe-sewing machines having a curved hooked needle and operating to form chain-stitches and commonly known as "welt" and "turn" sewing-machines.

As chain-stitch machines were constructed in the earlier stages of the art the needle was the only stitch-setting instrumentality performing the entire work of taking up the slack thread in the preceding loop (except, possibly, such as was incidentally taken by the looper) and of setting the stitch—that is to say, bringing the thread which forms the same into its final position in the seam. In this old method of setting the stitch by the needle the thread from the preceding loop had to render around the material between the needle-holes and a portion of the thread had to render under strain through the hook of the needle, and when this type of machine was applied to boot and shoe work for forming the seam which unites the insole, upper, and welt of a welted shoe and the sole and upper of a turn shoe many objectionable features were discovered.

In welt and turn sewing-machines, as far as I am advised of the art, it has not been found practical to provide clamps which firmly press the layers of material to be united together, as in through-and-through sewing-machines; but the layers of material are drawn together by the pull of the thread, which, where the chain is on the welt, as in most machines of this type, must be resisted principally by the "between substance," and since that portion of a turned outsole or welt insole is commonly somewhat spongy and soft, including only the inner fiber of the leather, it is liable

to be cut through or materially weakened, and, further, the chafing of the thread in the hook of the needle, due to its rendering under strain therein, is liable to weaken the thread, so that it will break under the heavy tension required to secure a tight seam.

The defects in the machines of the prior art above referred to were to a great extent remedied in the machine of the patent to French and Meyer, No. 412,704, dated October 8, 1889, which embodies, in addition to the instrumentalities of the earlier art, a cam-actuated take-up and a thread-finger. The take-up acts while the needle is in the stock to take up the slack in the preceding loop and draw it tight against the shank of the needle, the slack thread being drawn through the preceding needle-hole and thereafter acts as a pull-off to draw thread from the thread-supply through the tension. The thread-finger acts to provide slack thread on the side of the needle next to the preceding needle-hole. The devices above referred to reduce the rendering of thread around the between substances to a minimum and substantially reduce the amount of thread which renders through the hook of the needle under the tension strain. In the machine of the French and Meyer patent there is, however, a small amount of such rendering, the pull-off, or, more properly speaking, the "take-up" in its pull-off operation, not providing sufficient thread to enable the needle to draw out the loop to its required length before the thread encounters the tension resistance, and in the French and Meyer machine the needle in its retracting stroke as it approaches the limit thereof pulls some thread from the supply against the tension resistance, a part of which must render under strain through the hook of the needle. I have found that it materially improves the operation of this class of machines to prevent even the small amount of rendering under the tension strain above referred to by entirely relieving the needle of its heretofore-universal duty in this class of machines of pulling some thread during the drawing out of the loop against the full tension strain; and to the above end the present invention consists of the devices and combi-

nations of devices hereinafter described in this specification and pointed out in the claims.

It may be stated in this connection that the present invention is of particular utility where it is desired to use cotton thread. Cotton thread, while of sufficient tensile strength for many classes of boot and shoe work of the nature before referred to, is of such texture as to be easily frayed or stranded by rendering around the somewhat sharp edge of the needle-throat, and for that reason its use for in-seam-work has been extremely limited and, so far as I am advised, largely experimental. By preventing all rendering of the thread under full tension strain in the hook of the needle I have been able to secure a tight and durable seam with cotton thread, thus effecting a substantial decrease in the cost of the shoe.

The preferred embodiment of the present invention as applied to the machine of the French and Meyer patent before referred to is illustrated in the accompanying drawings, in which—

Figure 1 is a front view of the machine of said patent, showing the present invention as applied thereto in front elevation. Fig. 2 is a section taken on line $x-x$, Fig. 1, showing the tension device of the machine and a portion of the present invention in plan. Fig. 3 is a section through the tension device, taken on line $y-y$, Fig. 4. Fig. 4 is a side elevation with a large portion of the machine of the patent removed to more clearly illustrate the present invention.

The machine of the drawings is provided with a needle A, a looper B, a take-up C, and a thread-finger D, with suitable actuating mechanism for these instrumentalities, as fully shown and described in said patent and of which no detail description is deemed necessary herein. It may be also stated that all other parts shown in the drawings, unless otherwise described herein, are substantially the same as corresponding parts of said patented machine. In said patented machine the needle A descends through the last-formed loop to penetrate the material at the place where the loop next to be formed is to be brought through. As the needle enters the material the take-up C, which constitutes stitch-setting means, begins to act and while the needle is in the material draws up all the slack in the last loop which is then around the shank of the needle and draws said loop tightly down against the shank of the needle. The take-up C then begins to perform its pull-off function and by its further movement draws from the supply through the tension an amount of thread which, together with the thread taken from the last loop, is sufficient to allow the needle A to pull out the greater part of the next loop without drawing against the full tension strain; but in said patented machine before the needle has reached the limit of its retracting or thread-pulling stroke

it exhausts the thread in the preceding loop and that which has been drawn from the tension by the take-up in its pull-off operation, and during the final portion of its retracting or thread-pulling stroke the needle draws thread from the supply under the full tension strain, a portion of which thread renders under such strain through the hook of the needle. To apply the present invention to the said patented machine, I have connected with the tension device thereof mechanism timed and arranged to release said tension during the latter portion of the stroke of the needle, so that the needle during no portion of its stroke pulls against the full tension strain.

In the drawings, T represents the tension device, which, as shown, consists of a peripherally-grooved disk t , around which the thread E passes on its way from the wax-pot F to the stitch-forming devices. The disk t is mounted and free to turn on a shaft t' , secured in an arm t^2 , projected from a bracket t^3 , secured to the base of the machine, which commonly rests upon the supporting-column. On each side of the disk t is a washer t^4 of felt or other suitable material, the disk t being frictionally restrained from rotation between said washers to give the required tension. On the shaft t' is mounted a sliding sleeve t^5 , normally pressed against the washer t^4 by a spring, hereinafter described, to cause the disk t to be restrained from rotation, as just stated. A portion of the sleeve t^5 is cut away, and the remaining portion is provided with notches t^6 , which are engaged by the fork h of the lever H, which is fulcrumed at h' on an arm projected from the bracket t^3 . The lever H is extended toward the front of the machine and is connected at or near its front end by a pivoted connecting-rod h^2 with the swinging lever h^3 , which is pivoted at h^4 to a bracket h^5 , projected from the frame of the machine. The lever h^3 carries a truck or cam-roll h^6 , which is adapted to engage the cam h^7 , conveniently formed on the face of a cam-disk mounted upon and rotated by the shaft S, which is the main shaft of the machine. The cam-roll h^6 is held in contact with the cam h^7 by a suitably-placed spring acting upon the lever h^3 conveniently by the coiled spring h^8 , surrounding the connecting-rod h^2 and connected at one end to the lower end of the lever h^3 and at the other end to the bracket h^9 , secured to the base of the machine. The spring h^8 also acts through the lever H to press the sleeve t^5 against the washer t^4 to frictionally restrain the disk t from rotation, as before described. The above-described arrangement is such that a rotation of the cam h^7 by means of the lever h^3 , connecting-rod h^2 , and lever H retracts the sliding sleeve t^5 to relieve the pressure on the washer t^4 to allow the disk t to turn freely and thereafter permits the spring h^8 , which acts on the lower end of the lever h^3 by the same connections, to again advance the sleeve t^5 and cause it to press on the washer t^4 to again frictionally re-

strain the disk t from rotation. The cam h^7 is so timed and arranged with reference to the cams for actuating the needle A and take-up C that the tension is on the thread during the entire upward or thread-pulling movement of the take-up C and is relieved and the thread allowed to run freely from the supply during the entire retracting or thread-drawing movement of the needle A. I may say in this connection that since in the earlier portion of its retracting stroke the needle may get its thread from the prior loop or from a take-up or pull-off I do not regard it as an essential feature of my invention that the tension should be released during the earlier portion of the retracting stroke of the needle, my invention being characterized by the relieving of the tension during the latter portion of the stroke of the needle.

It is common in this class of machines to provide what is known as a "dry-thread" tension, which acts upon the dry or unwaxed thread before it enters the wax-pot and prevents the thread from becoming slack in passing through the same. In the preferred embodiment of my invention (illustrated in the drawings) I have connected such a device with the mechanism for releasing the tension proper in such a manner that when the tension is released the dry-thread tension is also released and the resistance which would tend to restrain the drawing of thread from the supply reduced to a minimum. I do not desire, however, to be understood as asserting that all resistance which would tend to prevent the running of the thread from the supply is removed during the latter portion of the stroke of the needle, for I consider a slight resistance necessary to the most successful operation of the machine. Such resistance, however, need be but slight, and the friction along the lead of the thread and resistance offered by the strippers in the wax-pot is ample. It may be added that a partial release of the tension at this time would be within the spirit of my invention, and the word "release" as used herein is used in its broadest sense to include any substantial diminution of the tension resistance.

In the drawings the dry-thread tension is shown as comprising a fixed jaw m , supported by a standard m' , secured to a plate on top of the wax-pot F. Coöperating with the fixed jaw m is a movable jaw m^2 , pivotally supported on the standard m' . The jaws m and m^2 are conveniently provided with the hardened gripping-plates m^3 , between which the thread passes, the thread leading from the ball or cap (not shown) conveniently through a suitable guide, as m^4 , between the plates m^3 through a suitable eye or guide in the top of the wax-pot F into said pot. The jaws m and m^2 are held together to grip the thread by a suitably-placed spring, conveniently the V-shaped spring m^5 , which is secured between said jaws back of the fulcrum of the movable jaw m^2 .

The movable jaw m^2 carries a stop m^6 , conveniently in the form of a bolt capable of adjustment, which is located to be engaged by a rod m^7 , depending from the lever H. The above-described arrangement is such that when the lever H is actuated by the cam h^7 to retract the sleeve t^5 to release the tension the rod m^7 contacts with the stop m^6 and moves the jaw m^2 away from the jaw m against the tension of the spring m^5 to permit the thread to run freely between the plates m^3 , and when the lever H is actuated by the spring h^8 to again advance the sleeve t^5 to restore the tension the rod m^7 is retracted and allows the spring m^5 to close the jaws m and m^2 and the dry-thread tension is restored. I desire to say in this connection that while the release of the dry-thread tension is not an essential feature of the present invention, considered broadly, which may be applied to machines having no such device, I consider it to be of importance in machines where such a device is used, and I desire to state that I am the first, so far as I am advised of the art, to provide means for simultaneously releasing both tensions automatically in timed relation to the operation of the needle whenever and however such release is effected.

In regard to the release of the tension proper I desire to say that I am aware that it has been proposed in the prior art to release the tension during the earlier portion of the retracting stroke of the needle, as shown, for example, in patent to Coupal, No. 385,299, dated June 26, 1888, and in the later patent to Bertrand, No. 637,225, dated November 21, 1899; but such advices are intended merely to relieve the strain on the thread while the needle is passing through the stock, a result which is secured by the pull-off of the machine of the drawings and which is essentially different from that secured by the present invention.

The operation of my invention having been sufficiently described in connection with the foregoing description of the construction and organization of its parts, I claim as novel and desire to secure by Letters Patent of the United States—

1. A chain-stitch sewing-machine, having, in combination, a needle, a looper, a tension, stitch-setting means, and means to release the tension during the latter portion of the loop-drawing stroke of the needle, substantially as described.

2. A chain-stitch sewing-machine, having, in combination, a needle, a looper, a tension, stitch-setting means, and means to prevent any pull by the needle on the thread against the tension resistance, substantially as described.

3. A shoe-sewing machine, having, in combination, a needle, a looper, a tension, a wax-pot, a dry-thread tension, and means for automatically releasing the tension and dry-thread tension in timed relation to the operation of the needle, substantially as described.

4. A chain-stitch sewing-machine, having, in combination, a needle, a looper, a tension, a take-up, means to release the thread from tension during the latter portion of the thread-
5 pulling stroke of the needle and to restore tension during the entire thread - pulling movement of the take-up, substantially as described.

5. A chain-stitch sewing-machine, having,
10 in combination, a needle, a looper, a tension, a take-up acting also as a pull-off and means

to release the tension during the latter portion of the thread-pulling stroke of the needle and to restore the tension during the entire thread-pulling movement of the take-up, substantially as described. 15

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

JAMES OSCAR SELBY.

Witnesses:

CHARLES R. MAXWELL,
W. C. EDWARDS.