

(No Model.)

2 Sheets—Sheet 1.

W. F. BEARDSLEE.

THREAD CONTROLLING MECHANISM FOR SEWING MACHINES.

No. 333,586.

Patented Jan. 5, 1886.

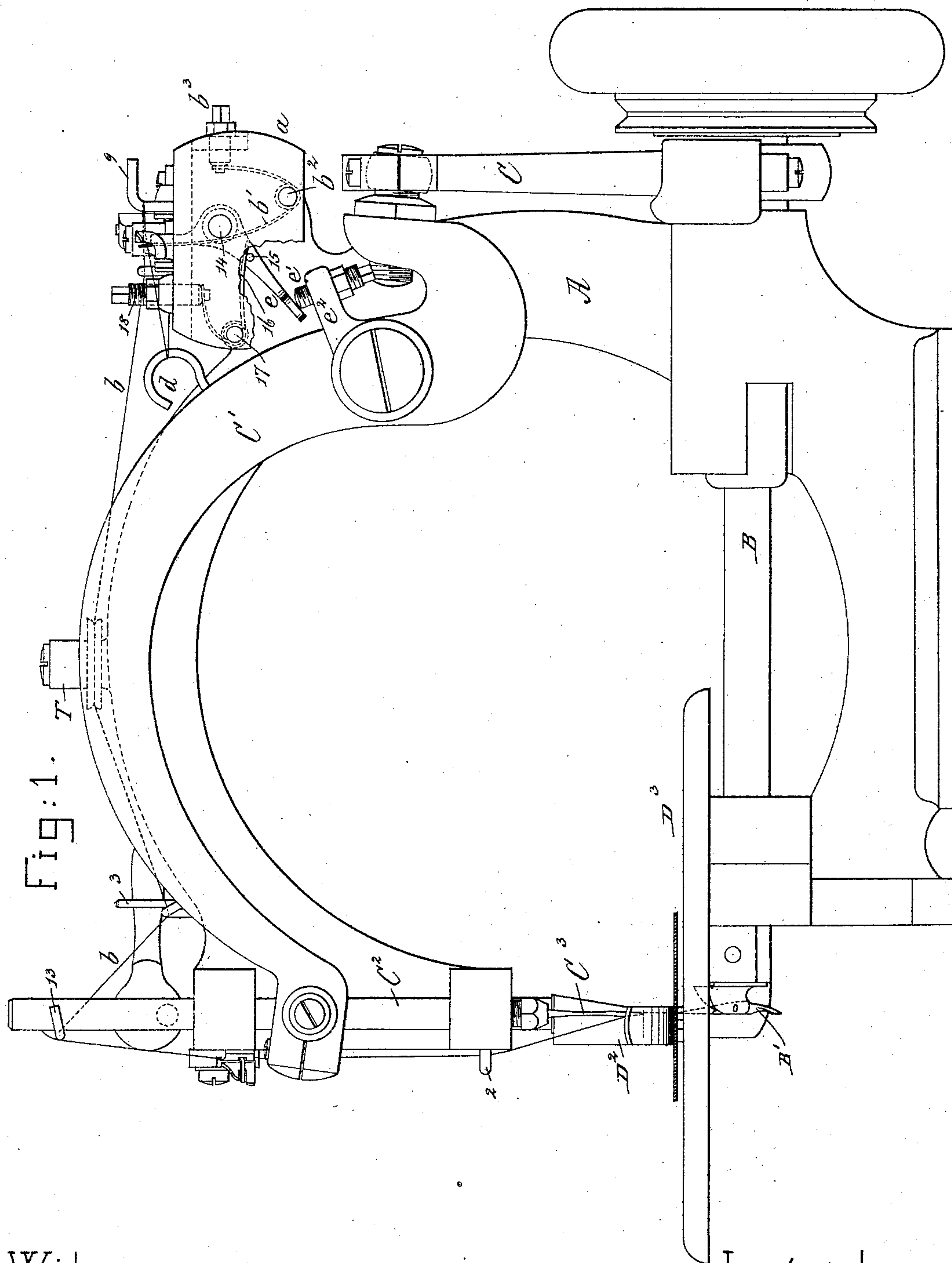


Fig. 1.

Witnesses.

Arthur L. Lippert.
Frank L. Ewing

Inventor

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by Crosby & Gregory
Atty's

(No Model.)

2 Sheets—Sheet 2.

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Fig: 2.

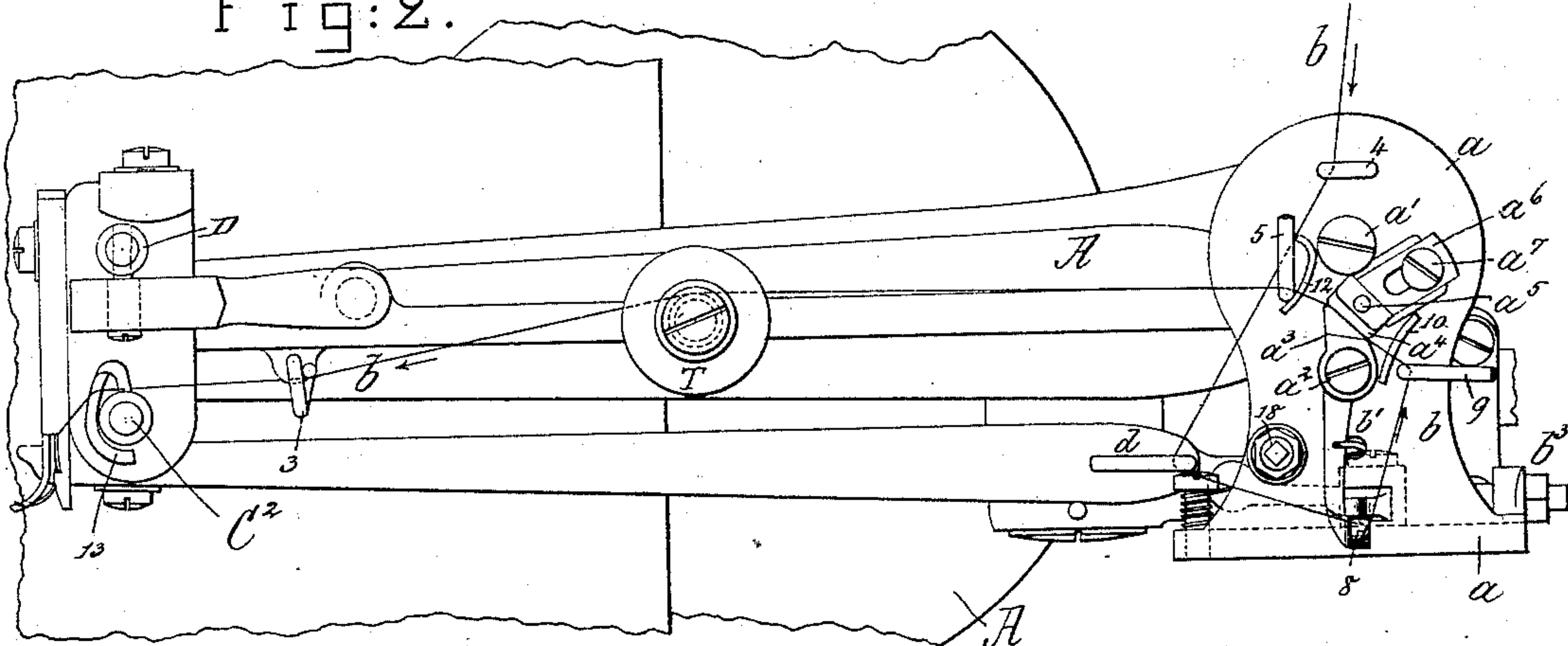


Fig: 3.

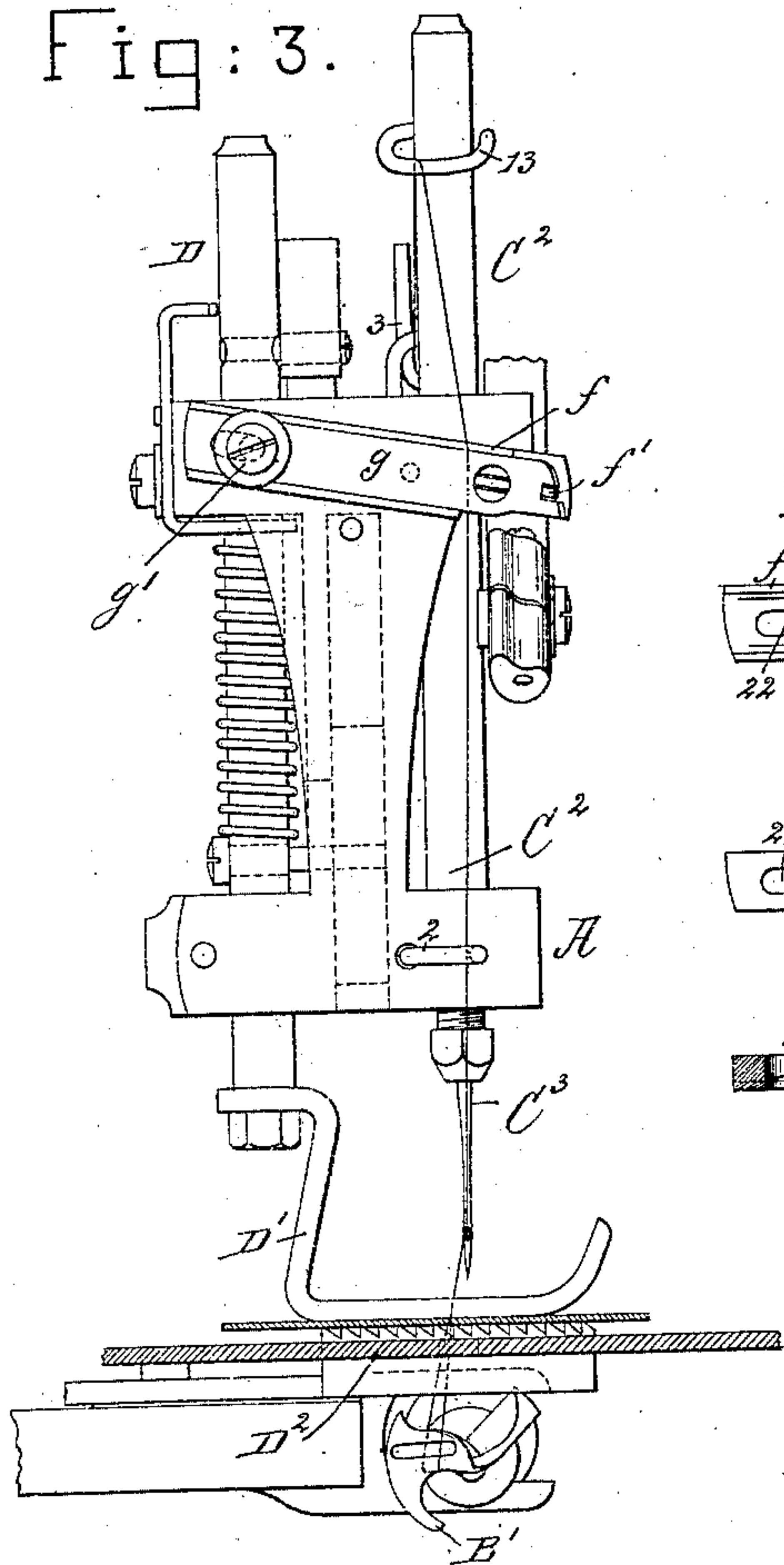


Fig: 4.

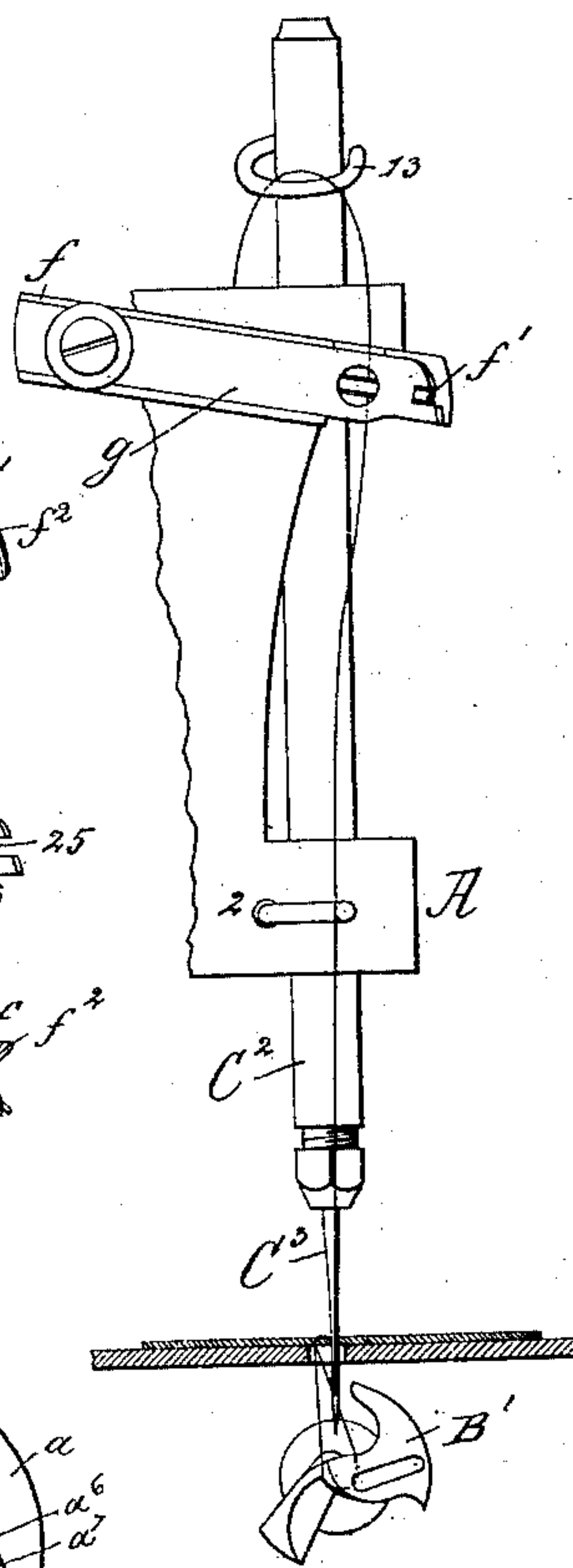


Fig: 5.

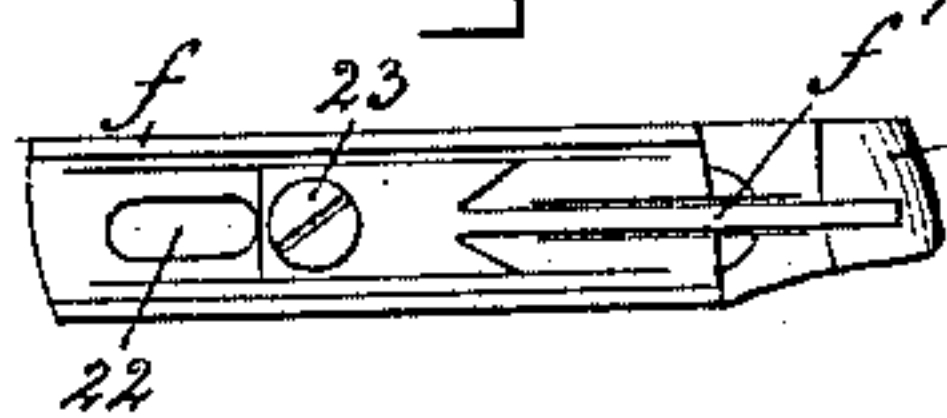


Fig: 6.

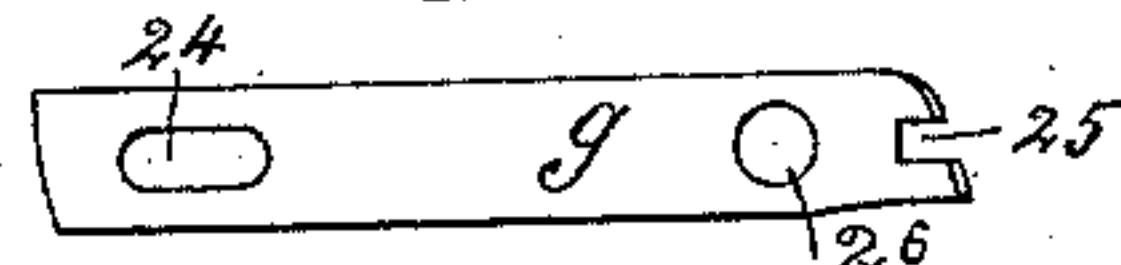


Fig: 7.

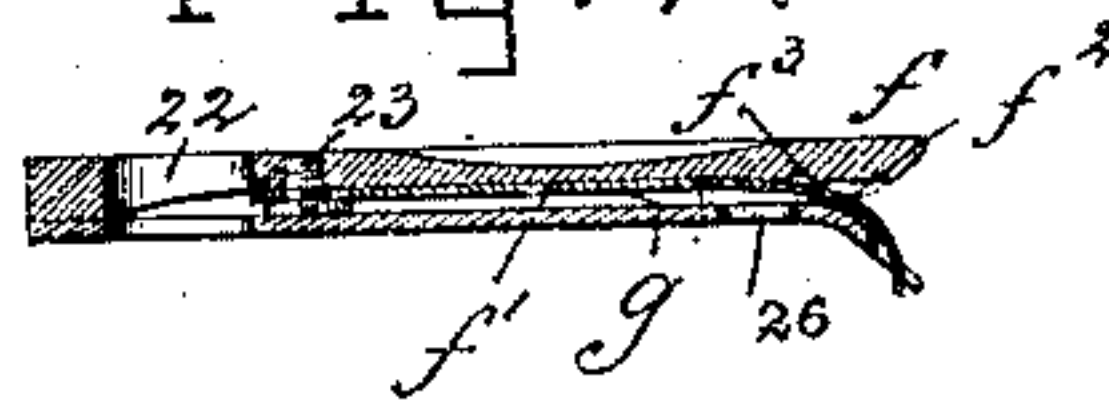
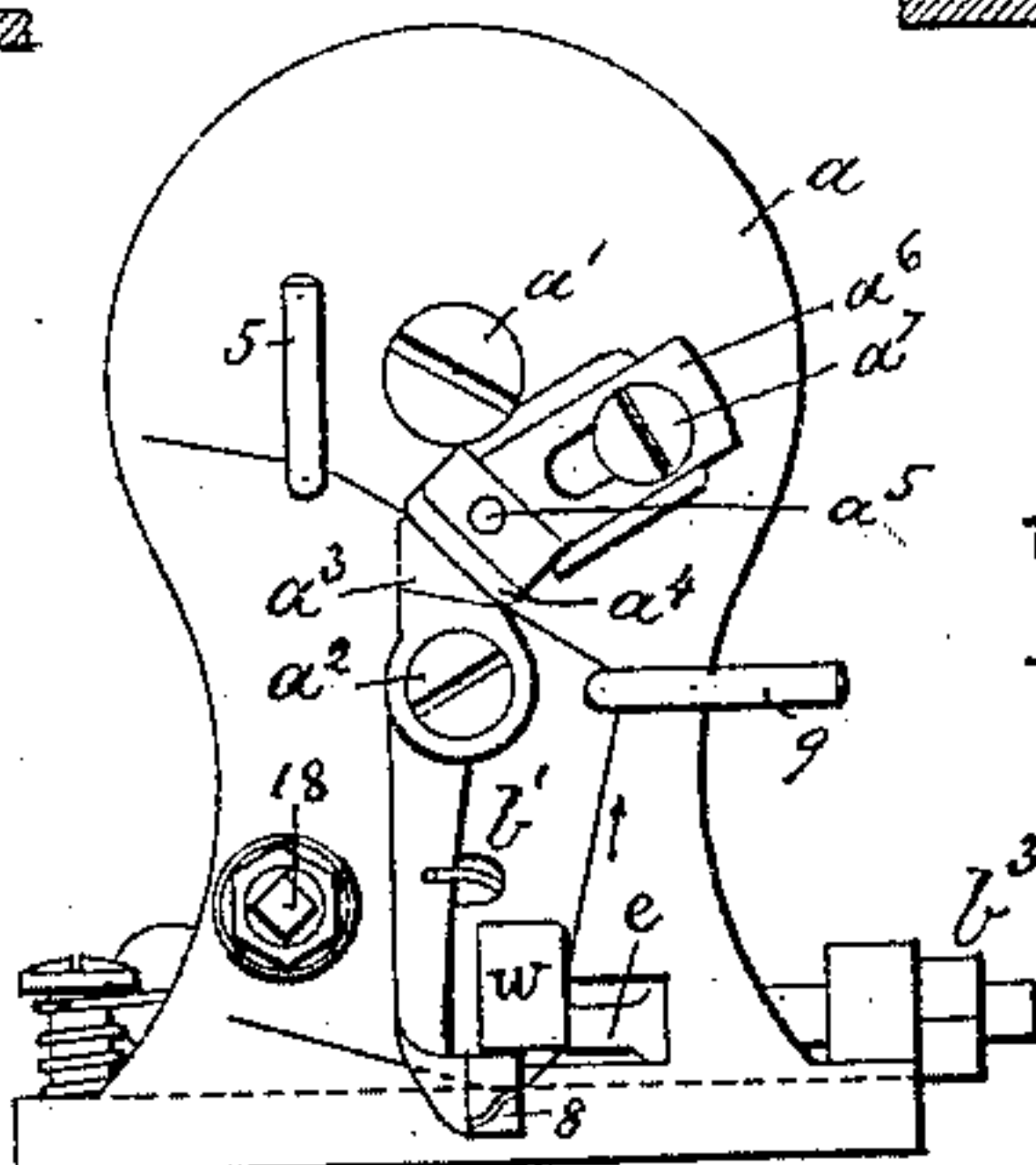


Fig: 8.



Witnesses.

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Frederic L. Emery

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UNITED STATES PATENT OFFICE.

WILLIAM F. BEARDSLEE, OF BOSTON, MASSACHUSETTS.

THREAD-CONTROLLING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 333,586, dated January 5, 1886.

Application filed May 20, 1885. Serial No. 166,089. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BEARDSLEE, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Thread-Controlling Mechanism for Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 In accordance with my invention, the needle-thread is held between the spool and needle-bar by a clamp, one member of which is acted upon by a spring, thus causing the clamp to have constant pressure, the clamp exerting at
15 all times a certain definite but constant pressure or tension, and acting at all times as a positive check to prevent any backward movement of the thread. The normal pressure on
20 the thread of the movable member of the thread-clamp is sufficient to exert such an amount of tension as is necessary for proper sewing, except when the needle-bar is at or near the upper portion of its stroke, and the
25 hook is going into its lowest position and drawing out the greatest length of loop, or just when the needle-bar and hook, co-operating together, are drawing up the loop of and completing or setting the previous stitch, and at
30 such times as the normal force of the thread-clamp is not sufficient to do good work I temporarily augment the clamping pressure on the needle-thread; and, as herein shown, I have
35 for such purpose employed a pressure-adjusting device (shown as a spring-controlled lever) which is made intermitting in its action, it being effective in holding the needle-thread only as the stitch is being set or completed, as stated. I have also provided the head of the
40 machine with a thread-holder, it acting to hold the thread intermittingly, as will be described, while the needle-bar is descending, to thus avoid slack thread near the eye of the needle, the said device being placed diagonally, and being made adjustable to facilitate
45 the entrance and exit of the needle-thread at just the proper time.

Figure 1, in side elevation, represents a sewing-machine of the Willcox & Gibbs pattern, my invention being shown as embodied
50 therewith, the bracket or plate of the thread-

controller being partially broken out; Fig. 2, a partial plan or top view of Fig. 1; Fig. 3, a partial front end view; Fig. 4, a detail of the front end of the machine, showing the needle-bar and hook in a different position; Fig. 5, 55 a detail showing the base and spring of the needle-thread holder; Fig. 6, a detail of the spring-protector. Fig. 7 is a longitudinal section of the entire thread-holder, and Fig. 8 a modification. 60

The frame A, hook-shaft B, hook B', link C, needle-bar-actuating lever C', needle-bar C² and needle C³, thread-guides 2 and 3, presser-bar D, presser-foot D', feed-bar D², and cloth-plate D³ are all substantially as in 65 the said Willcox & Gibbs machine.

The frame or bracket *a*, upon which are mounted the devices constituting my improved thread-clamping mechanism, is shown as fastened to the frame A by a screw, *a'*. The 70 frame or bracket *a* has pivoted upon it, at *a*², the movable member or lever *a*³ of the thread-clamp, the other member being shown as a rest, *a*⁴, made as a block, pivoted at *a*⁵ on a slide or foot-piece, *a*⁶, adjustably attached to 75 the plate *a* by a screw, *a*⁷, the said plate *a* being herein shown as provided with ribs, between which is placed the said foot-piece, the latter being slotted where the screw *a*⁷ enters it. The end of the movable clamping mem- 80 ber *a*³ next the rest *a*⁴ is beveled to act upon the thread, and the said member is so pivoted and shaped as always to act as a positive check to prevent any backward slipping or rendering of the thread passing between 85 it and the rest, the said movable member being normally held pressed against the needle-thread *b* by an adjustable spring, *b'*, (shown best by dotted lines, Fig. 1,) the said spring being shown as made from spring-wire, 90 a part of which is wound to form a coil to embrace the stud or pin *b*² of the plate *a*, the end of the spring *b'* opposite that acting on the movable member *a*³ being shaped to be acted upon and be adjusted by an adjusting-screw, 95 *b*³, the rotation of the said screw in or out increasing or decreasing, respectively, the force of the spring *b'* on the said movable member *a*³. This spring exerts its pressure constantly, and is never so strong as to prevent the nee- 100

dle-bar and hook, when acting together, from drawing from between the clamp sufficient thread for the requirements of the stitch being made. The needle-thread taken from a suitable spool or bobbin is passed through guide-eyes 4 and 5, thence through the pull-off *d*, through an eye, 8, in the long arm of the movable member or lever *a*³, thence through guide-eye 9, over the saddle 10, between the thread-clamping members *a*³ and *a*⁴, over saddle 12, again through the thread-guide 5, and between the disks of the tension device T, in the usual manner, if the latter be employed, as is preferred, thence through the thread-guide 3 and the guide 13, carried by the needle-bar, and thence between members of the thread-holder to be described, and into the guide 2, and through the eye of the needle.

Pivoted on the plate *a*, at 14, is a pressure-augmenting device, *e*, (shown as an elbow-lever,) provided with a pin or projection, 15, and acted upon by a spring, 16, as herein shown, of spring-wire having formed in it a coil, which embraces a pin or stud, 17, on the plate *a*, the opposite end of the said spring being bent to form an eye or loop, in which enters the end of an adjusting-screw, 18, turning of which screw in or out causes the force of the spring 16 to be increased or lessened, respectively, and in like manner regulating the extent of the pressure of the upper end of the pressure device or lever upon the thread-clamping member *a*³.

From the foregoing it will be seen that the needle-thread is clamped constantly by a force measured by one spring, but that at certain times, as during the completion of the stitch, the clamping force on the needle-thread is augmented by an independent pressure-augmenting device, and this is one of the chief features of my invention. When both the said pressure-augmenting device and the spring *b*¹ produce pressure upon the clamp, it is impossible for the hook alone to draw thread from the spool, except to accommodate for variations in thickness of the material; but when the pressure-augmenting device is not effective on the member *a*³, then the pressure of the spring *b*¹ acts to hold the thread with a constant pressure, but not so strongly as to prevent the hook and needle-bar taking the needle-thread and drawing it through between the clamp sufficient for the formation of the stitch, the pressure of the spring *b*¹ being constant, and being regulated by the adjusting-screw *b*³, according to the strength of the thread and the work being done. The extent of the pressure exerted by the pressure-augmenting device upon the clamping member *a*³ is relieved at the proper time during the descent of the needle-bar by means of the adjusting device or screw *e*¹ in the arm or finger *e*², attached to or forming part of the needle-actuating lever C', the release being sooner or later, according to the thickness of the material and the strength of the thread, so as to

put on the extra pressure at any desired part of the upper stroke of the needle-bar.

At the head of the machine is placed a needle-thread holder composed of a base, *f*, a spring, *f*¹, and a spring-protector, *g*. The base *f* is made as a plate with a slot, 22, to receive the screw *g*¹, and thus permit the base to be held in adjusted position on the head, and the holder is held in an inclined position on the head, as shown in Figs. 3 and 4, to facilitate the passage of the thread under and then out from under the control of the spring *f*¹ as the needle-bar rises and then descends. The base-plate is provided at its front with a recess, *f*³, at the rear side of a seat, *f*², in which rests the spring *f*¹, and in this recess having a wedge-shaped or inclined bottom is placed the needle-thread. As the needle-bar rises and draws the needle-thread taut the latter moves to the left in the space *f*³ and passes farther under the spring *f*¹, where it is left, and so caught it is held lightly while the needle is passing through the first portion of its descent, thus preventing the formation of slack thread under the point of the needle; but as soon as the needle enters the material being sewed the downward pull on the thread, owing to the diagonal or downward inclination of the spring *f*¹, quickly draws it from under the spring into the notch *f*³, and the thread is left entirely free from any pressure of the spring *f*¹ thereon. The spring *f*¹, made widest at its inner end, is connected with the base by a screw, 23. The spring-protector *g* is attached in place by the screw *g*¹ in the slot 24, and the notch 25 in the protector acts as a guide for the outer end of the spring, the hole 26 permitting the movement of the thread to be seen. The pull-off *d*, connected with the needle-bar-actuating arm, draws from the spool or bobbin (not shown) sufficient thread for each stitch, leaving it loose at the rear side of or behind the clamp.

The clamp herein described is so shaped and its parts are so pivoted as to positively prevent any backward movement of the thread, but permitting the free forward travel of the thread whenever the pull upon the thread is sufficient to overcome the pressure exerted thereon by the clamp, and it will also be seen, whenever the thread is strained or drawn by the needle-bar or the hook, that the said thread extended through the eye 8 in the long end of the movable member of the clamp acts to close the clamp closer and closer, thus preventing any back rendering of the thread, and especially when the pull-off is acting to take thread from the spool of the bobbin.

I desire it to be understood that instead of putting the extra pressure on the member *a*³, and by it on the thread, as a modification I might place a block, *w*, near the long end of the member *a*³ and let the needle-thread pass between the said block and the upper end of the elbow-lever *e* while on its way from the eye 8 to the eye 9, as in Fig. 8.

In the modification shown in Fig. 8 the block

w is located at one side of the member a^3 , and to adapt the lever e to act upon it requires only a slight change in the position of the fulcrum of the lever e and the prolongation of one of its arms.

I claim—

1. A thread-controlling mechanism for sewing-machines, it containing as elements a thread-clamp composed of two members, between which the thread is passed, one of the said members being made as a lever, through which the thread passes and acts when strain is put upon it, thus turning the lever to close the clamp upon the thread, and of a spring to act upon one of the said members to determine the degree of the constant pressure of the clamp upon the thread, and of a pressure-augmenting device to effect the increase in the clamping pressure upon the needle-thread just while the stitch is being set or completed, substantially as described.

2. The plate, the clamping member a^3 , provided at one end with a face to bear upon the needle-thread, and at its other end with an eye or notch to receive the needle-thread, the opposed rest for the thread opposite the said movable member, and an adjustable spring to produce a constant pressure on the said movable member, combined with a lever and adjustable spring to act intermittently upon the said movable member, substantially as described.

3. The plate, the clamping member a^3 , provided at one end with a face to bear upon the needle-thread, and at its other end with an eye or notch to receive the needle-thread, the opposed rest for the thread opposite the said movable member, a spring to produce a constant pressure on the said movable member, and a lever, e , and a spring to act upon the

said lever, combined with means, substantially as described, to act upon the said lever and permit it to act intermittently upon the movable member, as set forth.

4. The head A of the machine, the needle-bar, its attached guide 13, to receive the needle-thread through it, and the needle and rotating hook, combined with the thread-holder, composed, essentially, of the notched plate f and the spring f' , the latter being placed in an inclined and diagonal position across the face of the said head and across the plane in which the needle-bar is reciprocated, all substantially as described.

5. In a sewing-machine employing an eye-pointed needle for carrying the thread, and a rotating hook for forming the same into a chain-stitch, the thread-clamping members a^3 , a^4 , the adjustable spring acting thereon in all positions of the needle-bar to determine the degree of constant or minimum pressure, and the pressure-augmenting mechanism to intermittently increase the so-called "constant" or "minimum" pressure on the needle-thread, and the pull-off and means to move it, combined with the head A and the thread-holder, consisting, essentially, of a notched plate, f , and spring f' , the latter being placed in an inclined and diagonal position on the head relatively to the plane of the path of the needle, to catch and hold the needle-thread during the first part of the descent of the needle-bar, as and for the purpose described.

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

WM. F. BEARDSLEE.

Witnesses:

GEO. W. GREGORY,
W. H. SIGSTON.