

No. 652,528.

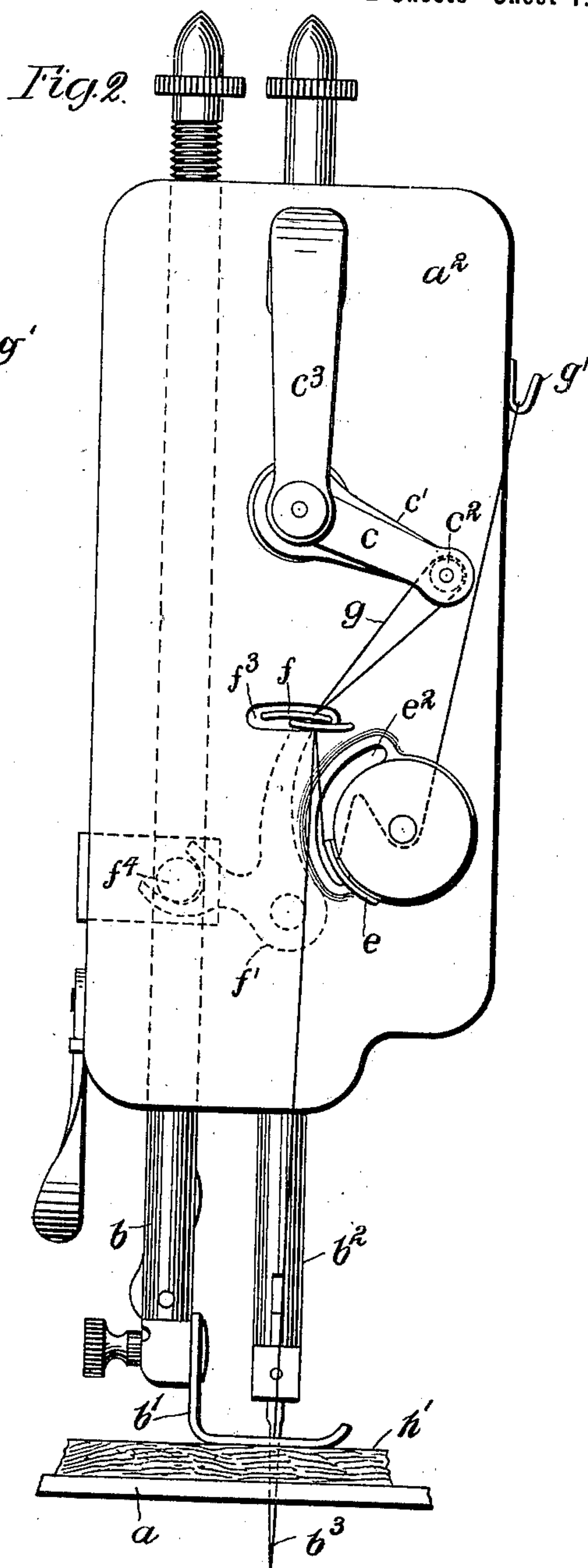
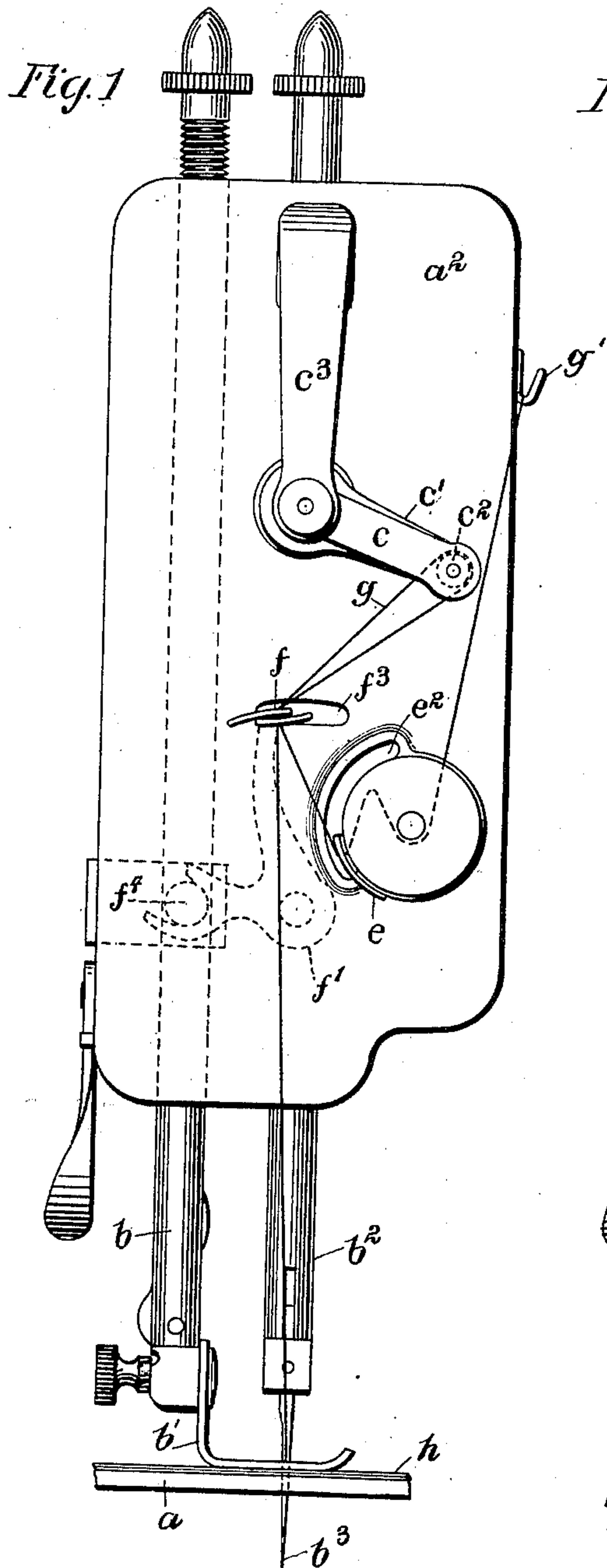
Patented June 26, 1900.

W. M. AMMERMAN.  
THREAD CONTROLLER.

(Application filed Sept. 9, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 3.

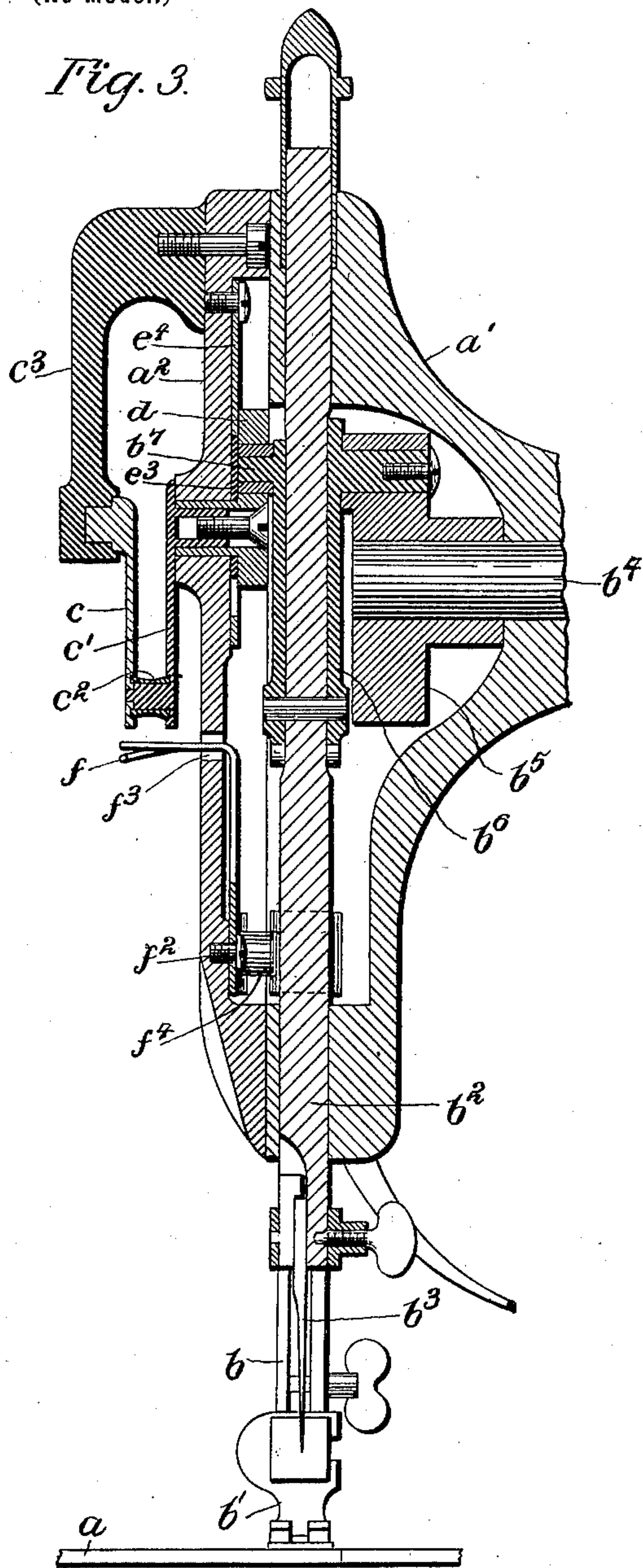
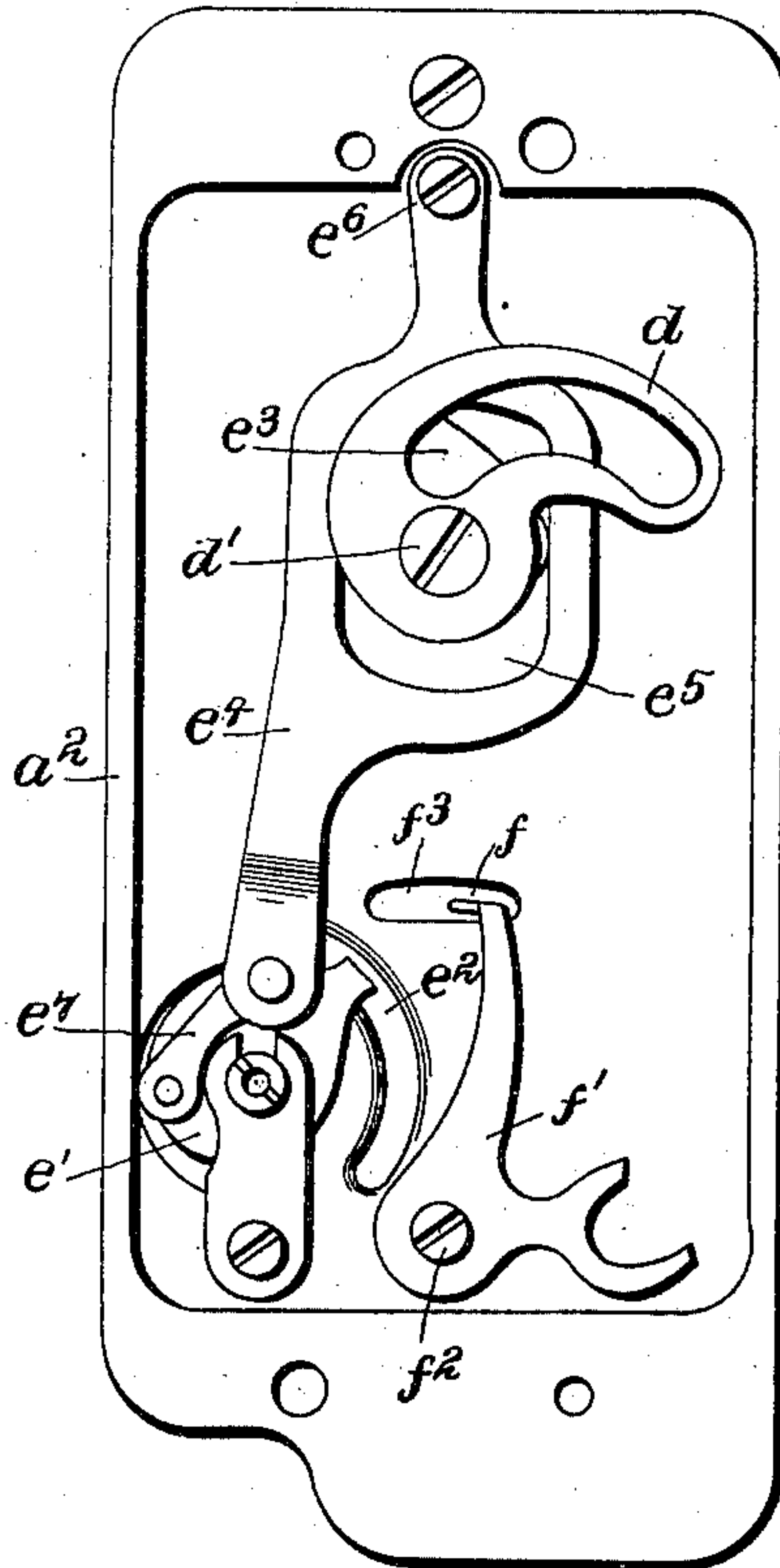


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## THREAD-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 652,528, dated June 26, 1900.

Application filed September 9, 1898. Serial No. 690,607. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM M. AMMERMAN, a citizen of the United States, and a resident of the city and county of New Haven, State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines, of which the following description, taken in connection with the drawings herewith accompanying, is a specification.

This invention relates particularly to the take-up and certain devices coöperating therewith for acting upon and controlling the needle-thread during the formation of stitches.

As well understood, in the operation of forming the ordinary lock-stitch the upper or needle-thread loop passes over or around the bobbin and bobbin-case, so as to interlock with the lower or bobbin thread, and should then in order to make a proper and desirable stitch be drawn up by the take-up until the lock between the needle and bobbin thread is at the center of the fabric or goods being operated upon. It will therefore be obvious that the amount or length of thread given out for each stitch should vary more or less, according to the thickness of the work being operated upon, as if the work is thick it will necessarily require a greater length of thread to allow the loop to be drawn up into the work until the lock is at the center of the latter than it would if the work were of less thickness. Having in view the above facts, it has been one of the principal objects of my present invention to provide a simple and effective means for automatically regulating the proper length of thread required for each stitch according to the varied thickness of the work being operated upon.

Referring to the accompanying drawings, Figures 1 and 2 represent front end elevations of the arm of a sewing-machine embodying my invention and a portion of the cloth-plate, showing the positions assumed by the parts where work of different thickness is being operated upon. Fig. 3 is a central vertical section through the arm of the machine, at the front end thereof. Fig. 4 is a rear or inside view of the face-plate removed from the machine-arm, showing the several parts connected therewith forming part of the take-up

and thread controlling and regulating mechanism.

To explain in detail, *a* represents a portion of the cloth-plate of the machine; *a'*, the overhanging arm thereof; *a<sup>2</sup>*, the detachable face-plate in the front end of the arm; *b*, the presser-bar; *b'*, the presser-foot; *b<sup>2</sup>*, the needle-bar; *b<sup>3</sup>*, the needle, and *b<sup>4</sup>* the driving-shaft, which is supported in suitable bearings in the arm *a'* and adapted for operating the needle-bar, take-up, and the operating parts in the head of the machine. The above parts are of usual and well-known construction.

The take-up device in the present instance illustrated is of the rotary type and consists of two arms *c c'*, which are fastened together at or near one end, with a proper space between the same for the passage of the thread, by a pin or other suitable connecting-piece *c<sup>2</sup>*. This connecting-piece *c<sup>2</sup>*, over which the thread is adapted to be passed and carried, forms the take-up proper. The opposite or inner end of the arms *c c'* are each supported in suitable oppositely-located bearings, one bearing being in the face-plate *a<sup>2</sup>* and the other in a fixed overhanging arm or bracket *c<sup>3</sup>*, projecting from the said face-plate, as shown. The take-up thus having a bearing at each side thereof, whereby any springing or yielding of the same during operation is prevented, renders such take-up particularly desirable for heavy sewing, where the strain upon it is greater than in ordinary sewing. The described arrangement of the two arms of the take-up, in combination with the overhanging arm or bracket *c<sup>3</sup>*, also prevents the thread from becoming thrown off or disconnected from the take-up. The inner arm *c'* of the take-up has a rigid connection with a slotted crank *d*, located in the inner side of the face-plate, through the medium of a fastening-screw *d'*, as more clearly shown in Figs. 3 and 4. This crank-arm is operated to rotate the take-up from the crank-disk *b<sup>5</sup>* in the end of the driving-shaft *b<sup>4</sup>* through the medium of the needle-bar pitman *b<sup>6</sup>*, which latter is provided with a pin *b<sup>7</sup>* thereon, extending and operating within the slot in the crank *d*.

In the operation of the take-up and during



the time it is moving downward in a direction to supply the necessary length of thread for the formation of the stitch, but before the hook or shuttle has entered the loop thrown out by the needle, there is a certain amount of slack thread between the take-up and the work, which it is desirable to control. This slack thread is controlled by a vibrating controller *e*, which is operated at the proper time to take up such slack in the thread and then release the same as the looper engages with the thread-loop and begins to draw the same in passing it around the bobbin. The controller *e* in the present instance illustrated consists of a lever *e'*, which is pivotally secured to the rear side of the face-plate *a*<sup>2</sup>, as more clearly shown in Fig. 4, and formed with the end thereof projecting outwardly through an elongated opening *e*<sup>2</sup> in the said face-plate, so as to engage with the thread. The projecting thread-engaging end of the controller is bent in the form of a hook, beneath which the thread may be readily passed or inserted, as shown. The controller-lever *e'* is operated from a cam or eccentric *e*<sup>3</sup> in the driving-shaft *b*<sup>4</sup> by means of a lever *e*<sup>4</sup>, which is slotted at a point between its ends, as at *e*<sup>5</sup>, to embrace said operating cam or eccentric and is pivotally secured at one end upon the rear side of the face-plate at *e*<sup>6</sup> and at its opposite end connected with the controller-lever through the medium of a link *e*<sup>7</sup>. By this construction it will be understood that as the lower end of the lever *e*<sup>4</sup> is vibrated by the cam *e*<sup>3</sup> it will communicate a rocking movement to the controller-lever through the link *e*<sup>7</sup> and cause its outer thread-engaging end to rotate and act upon the thread, as before described.

In order that the amount or length of thread given down at each stitch may be automatically regulated according to the thickness of the work being operated upon, I have provided a movable eyelet or thread-guide *f* to receive the upper thread *g* at a point between the take-up and needle to regulate the delivery of the same in a manner as will hereinafter be described. This thread-guide *f*, which, having in mind its function, might also be properly termed a "controller," consists of an elbow-lever *f'*, which is pivotally supported at *f*<sup>2</sup> upon the inner side of the face-plate *a*<sup>2</sup>, with one end projecting outwardly through an elongated opening *f*<sup>3</sup> in the face-plate, so as to engage with the upper thread, and its opposite end being bifurcated to embrace a pin or projection *f*<sup>4</sup> in the presser-bar, whereby the lever, with its thread-guide, will be movable with the latter.

The projecting thread-engaging end of the guide, which is denoted at *f* and forms the guide proper, is in the present instance shown formed with two fingers, which are bent so as to form an inclosed opening or eye to receive the thread and by reason of their ends being separable enable the thread to be readily inserted at any point into such

inclosed eye. Any suitable form of eye or guide other than that shown may be employed.

I will now proceed to describe the operation of the machine as described.

In threading the machine the thread is passed from the spool or other supply over a guide *g'*, between the impinging disks of the latter to and under the controller *e*, from the latter up through the movable guide *f* and over the take-up, and then down again through said movable guide to the needle, all as clearly shown in Figs. 1 and 2. Now supposing that thin goods, as shown at *h* in Fig. 1, are being operated upon, the presser-foot is comparatively close to the cloth-plate, and the guide *f* is at or adjacent to the left end of the slot *f*<sup>3</sup> in the face-plate, in which position it remains while goods of the same thickness are being operated upon. As thicker goods are fed under the presser, as shown at *h'* in Fig. 2, the presser-bar is correspondingly elevated and acts upon the lever *e'* to move the guide *e* toward the right a like distance. Such movement of the guide *e* toward the right lessens the distance between the take-up pin and the needle through said guide correspondingly, and thus gives the increased length of thread necessary for the increased thickness of material, as will be readily understood. During the following operation of the take-up in drawing from the spool the necessary length of thread for the succeeding stitch, which it accomplishes at the time it is drawing up the stitch, the guide in its changed position now causes such increased length of thread to be drawn from the thread-supply as is required for the different thicknesses of the work. By means of the combination and operation of parts as above described the amount of thread necessary to produce a uniform stitch for goods of varying thicknesses is automatically regulated.

Having thus set forth my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a sewing-machine, the combination of a bracket-arm secured upon the face-plate and formed with a part thereof extending substantially parallel with said face-plate and with a space between the same, and a rotary take-up embodying two arms or plates having a pin or connection between the same adjacent to one end for engaging with the thread, and at their opposite ends being supported in oppositely-located bearings in the face-plate and in said bracket-arm, respectively, the said bracket-arm and take-up being so connected as to prevent lateral displacement of the thread from the latter.

2. In a sewing-machine, the combination with a rotary take-up, and a slack-thread controller, of a thread-guide and stitch-controller, consisting of a pivoted elbow-lever having one end projecting through a slot in the face-plate and engaging with the thread at a point between the take-up and slack-



thread controller, and at its opposite end having connection with the presser-bar to be moved thereby, substantially as and for the purpose set forth.

5 3. In a sewing-machine, the combination, with a rotary take-up, and an oscillating slack-thread controller, of a thread-guide and stitch-controller, consisting of a pivoted lever having one end projecting through an open-  
10 ing in the face-plate and engaging with the

thread at a point between the take-up and slack-thread controller, and at its opposite end having connection with the presser-bar to be moved thereby, substantially as and for the purpose set forth.

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Witnesses:

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