

No. 626,087.

Patented May 30, 1899.

F. W. OSTROM.

THREAD CONTROLLER FOR BUTTONHOLE SEWING MACHINES.

(Application filed July 27, 1898.)

(No Model.)

4 Sheets—Sheet 1.

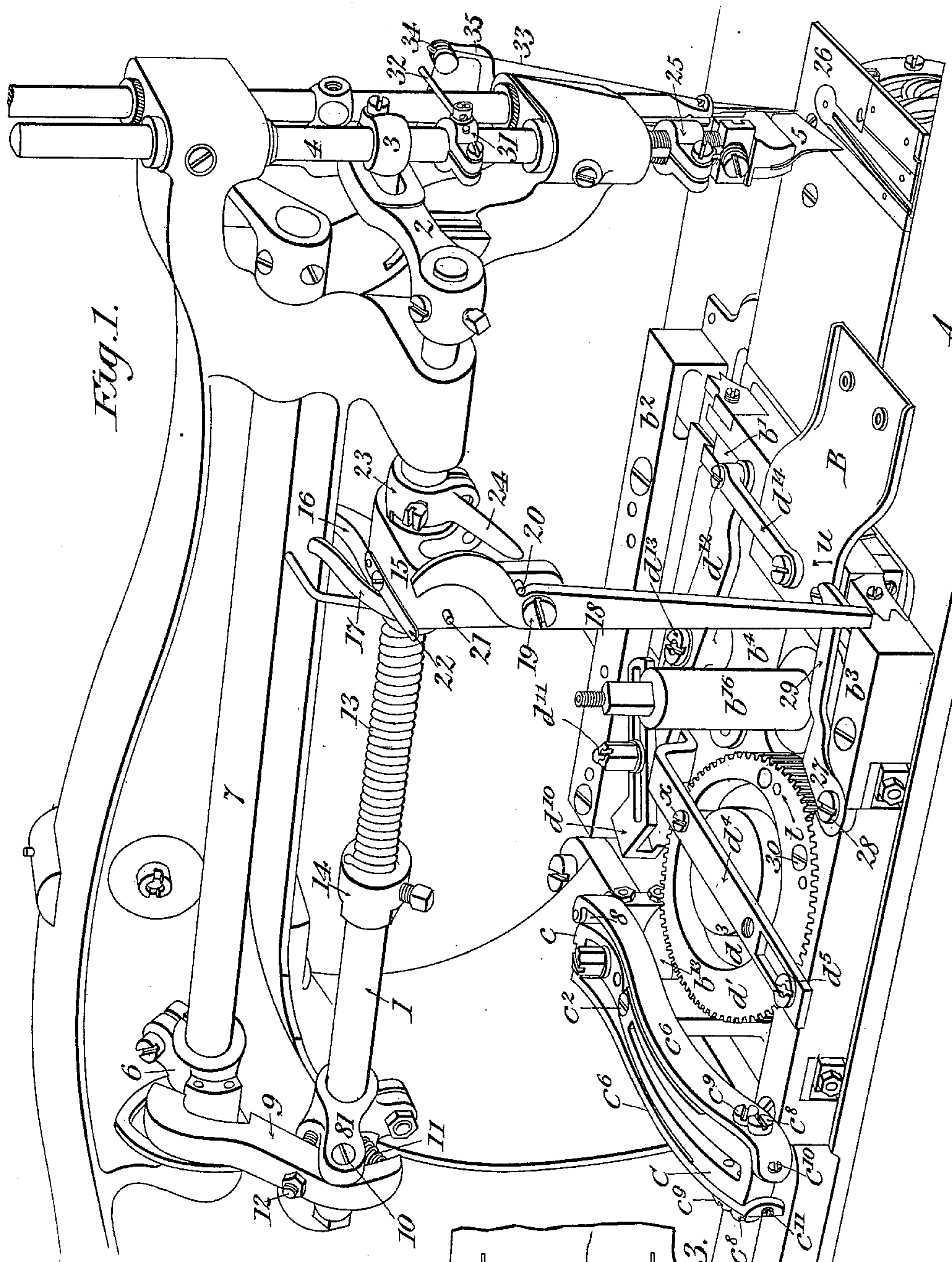


Fig. 1.

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Fig. 4.

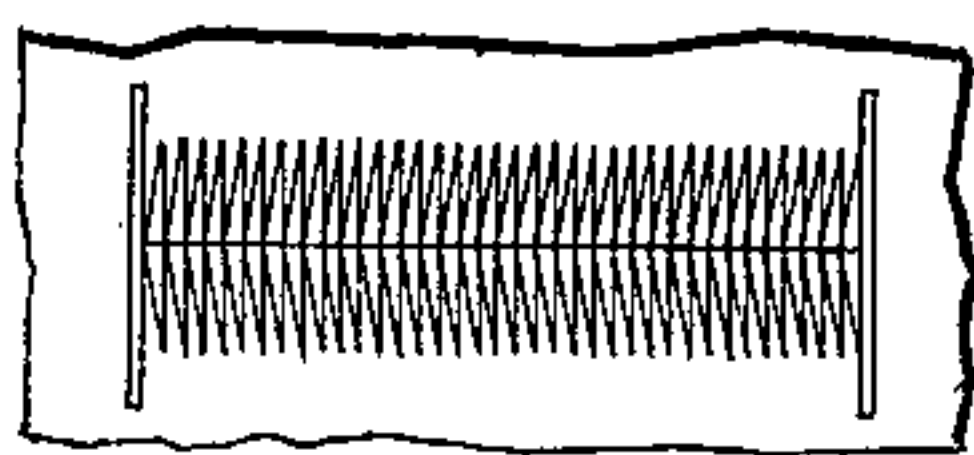
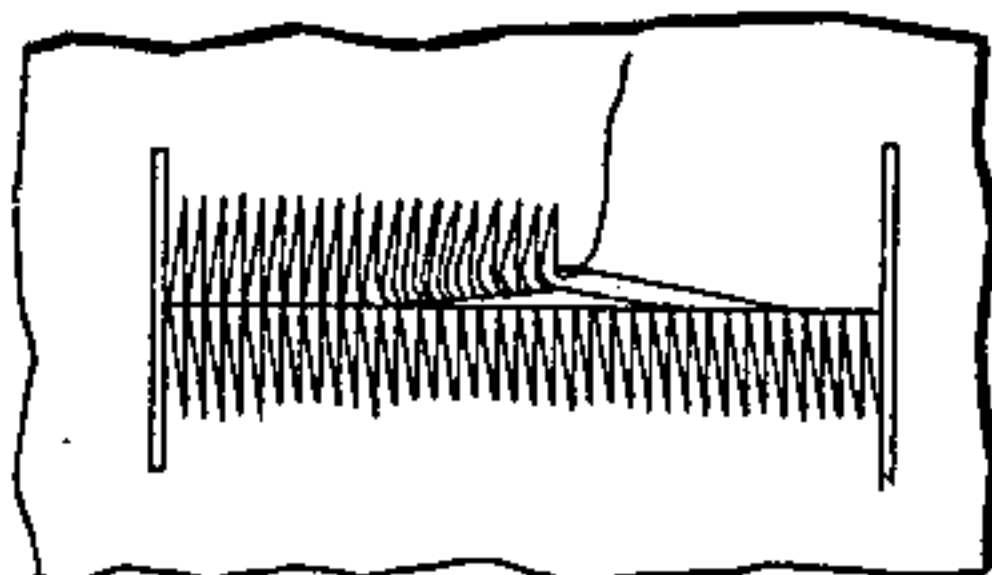
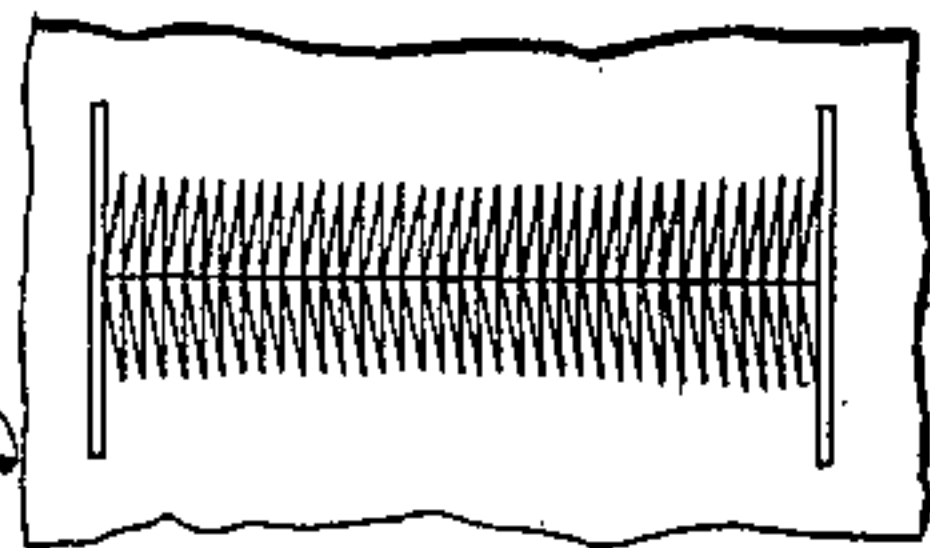


Fig. 2.
Fig. 3.

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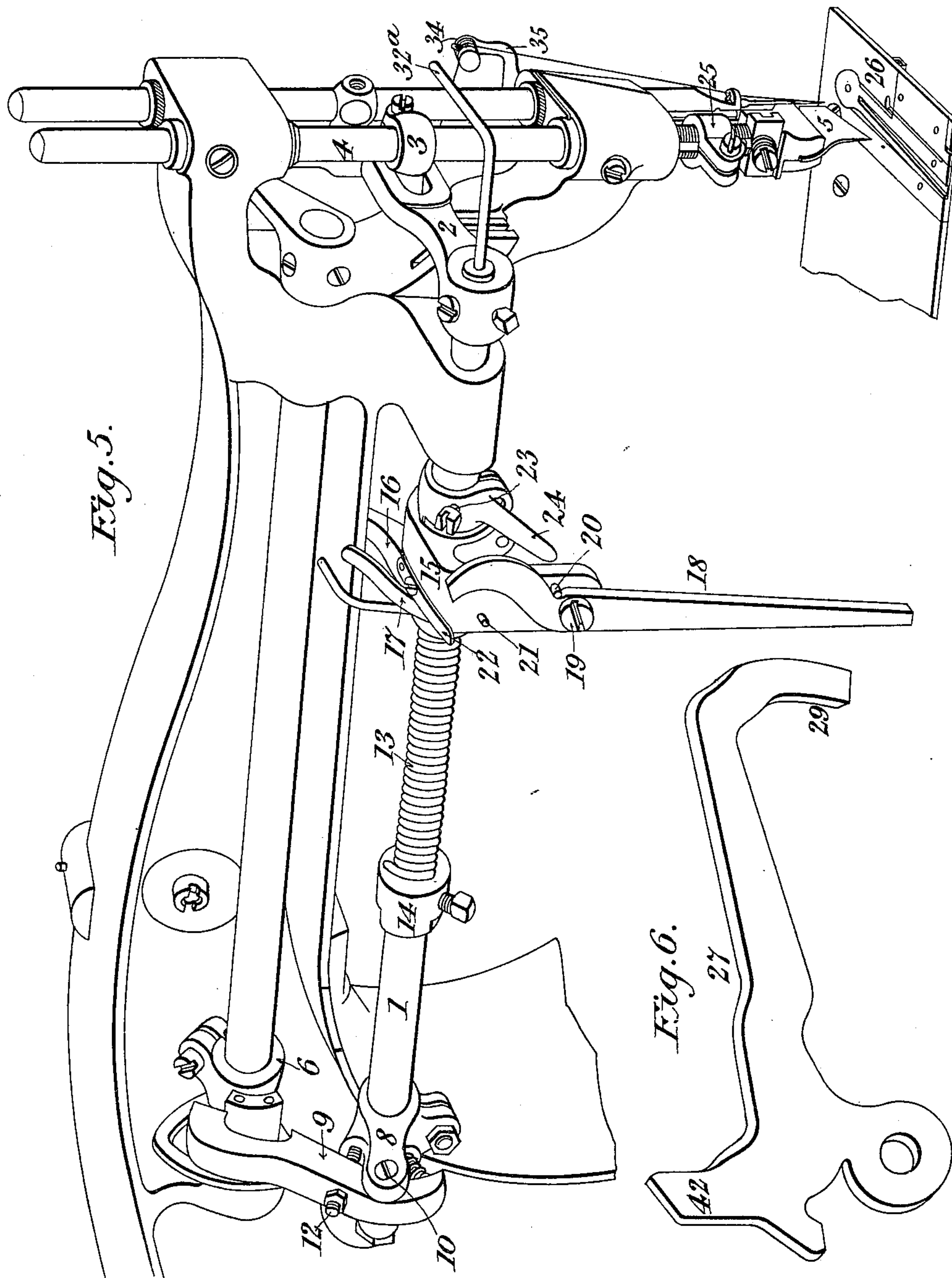
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4 Sheets—Sheet 2.



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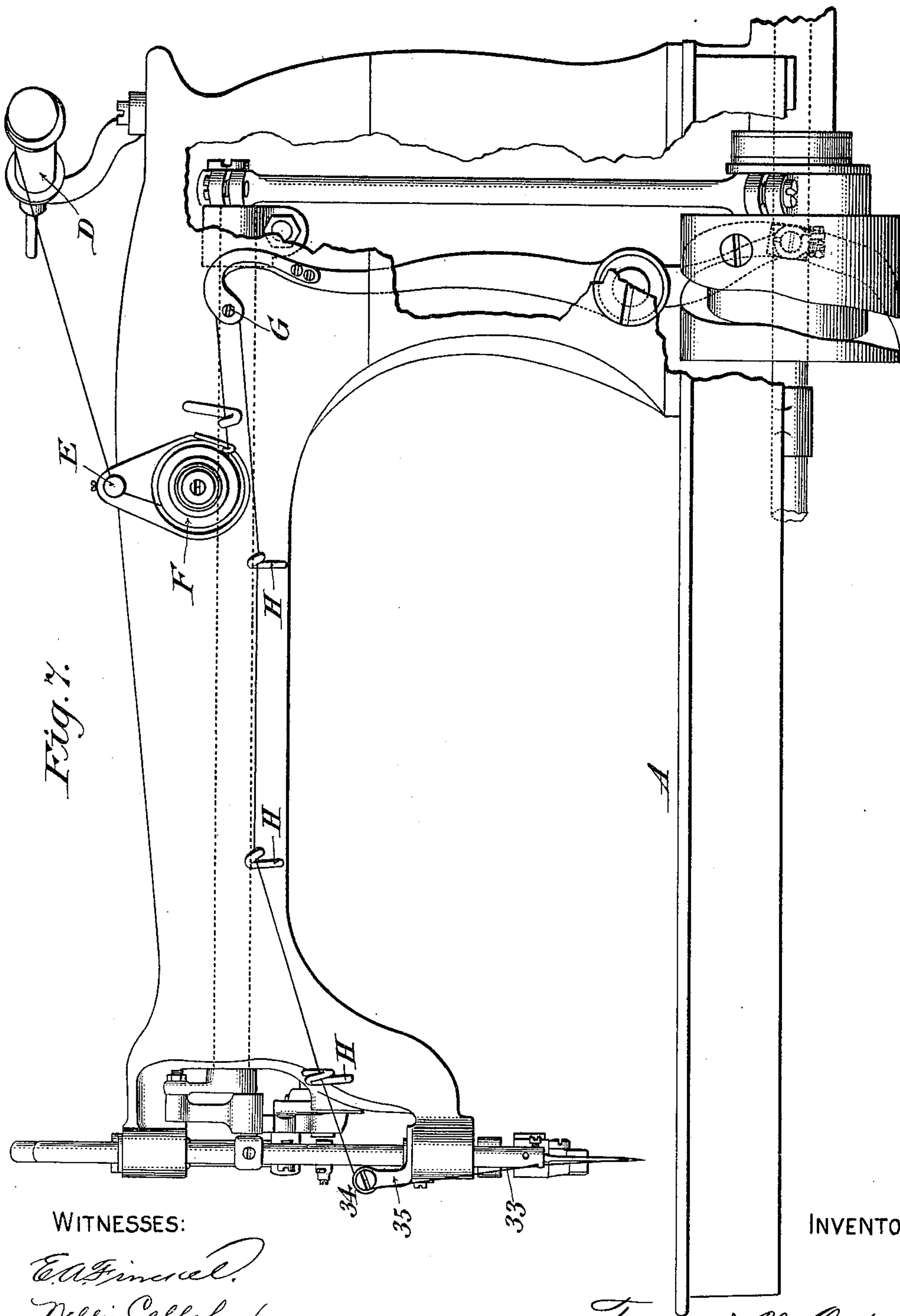


Fig. 7.

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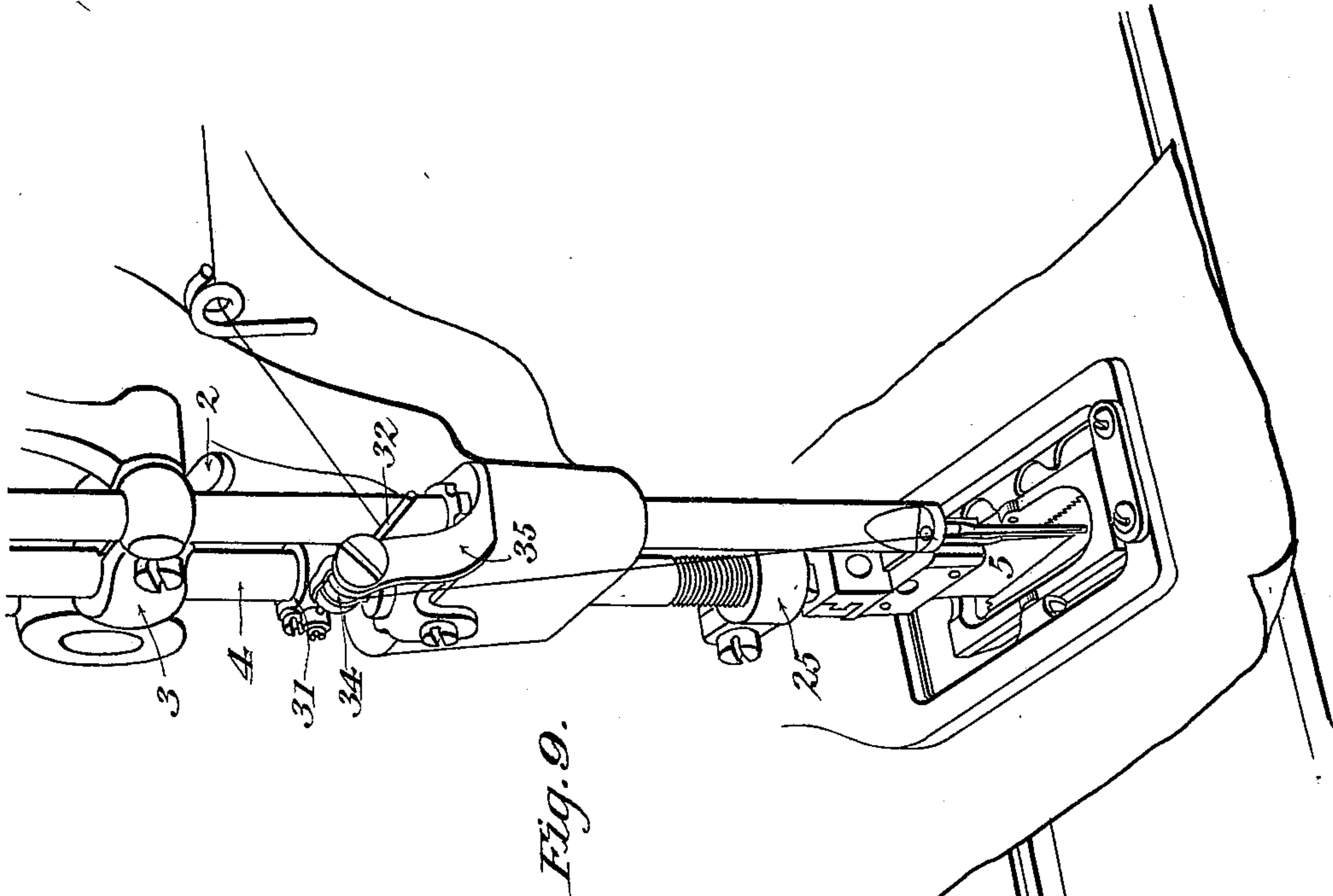


Fig. 9.

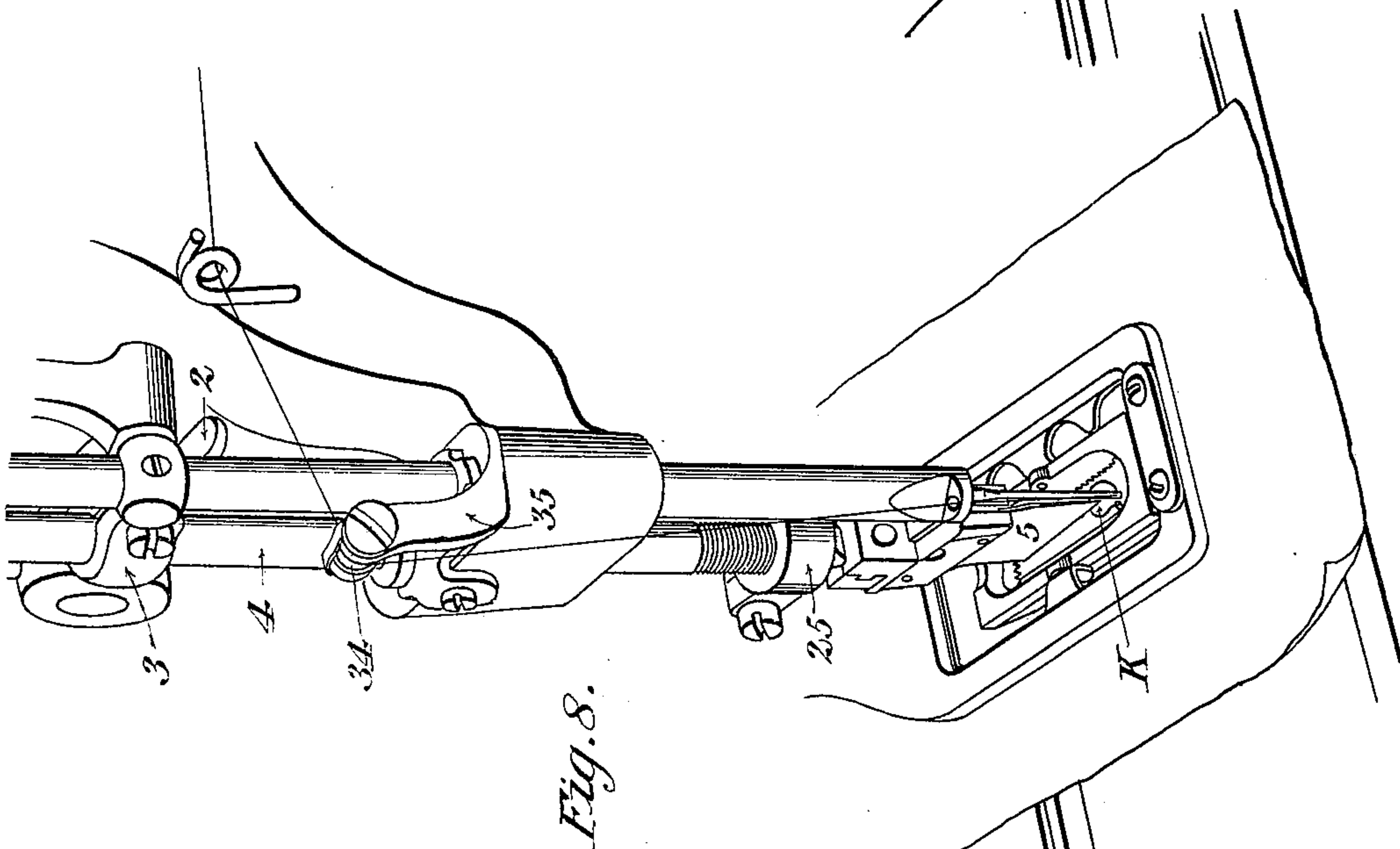


Fig. 8.

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UNITED STATES PATENT OFFICE.

FREELAND W. OSTROM, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE
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THREAD-CONTROLLER FOR BUTTONHOLE-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 626,087, dated May 30, 1899.

Application filed July 27, 1898. Serial No. 686,985. (No model.)

To all whom it may concern:

Be it known that I, FREELAND W. OSTROM, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented a certain new and useful Improvement in Thread-Controllers for Buttonhole-Sewing Machines, of which the following is a full, clear, and exact description.

The object of this invention is to protect the needle-thread from the descent of the buttonhole-cutter at such time as the cutter is automatically actuated to cut the buttonhole-slit, and thus better to adapt the stitch-forming mechanism to the overseaming of a buttonhole-slit which is automatically cut in the material while the material is held in the cloth-holding clamp in stitching position and during the initial overseaming of the buttonhole.

My invention belongs to that class of sewing-machine devices commonly termed "thread-controllers."

Thread-controllers which are continuously operative are common to sewing-machines generally, whether employed for straight or fancy sewing or for stitching predetermined figures, as in automatic buttonhole-overseaming, and the function of such controller is to better adapt a uniform throw of the sewing-machine take-up to varied lengths of stitch and thickness of materials.

The time of effective operation of a thread-controller relatively to the formation of a stitch is the interval between the initial movement of the take-up in the direction to supply thread to the needle-eye and the piercing of the material by the needle-point. At such time the movement of the thread-controller takes up the slack in the needle-thread between the material and needle, effecting a slight tension on the needle-thread until the needle-point has entered the material.

In the class of buttonhole-sewing machines herein represented it has been the custom to cut the buttonhole-slit between the lines of overseaming just prior to the completion of the overseaming of the last side of the buttonhole, leaving the material intact or uncut until the overseaming operation is nearly completed. This manner of overseaming and cut-

ting buttonholes permits the employment of the continuously-operative thread-controller common to sewing-machines generally, for the reason that in such instances the overseaming consists simply in the formation of stitches under the conditions of ordinary seam-sewing.

In the overseaming of a buttonhole-slit the action of a continuously-operative controller interferes with the proper alinement of the depth stitches, (the stitches back from the edged stitches,) effecting an overseam-stitch gradually narrowed as the overseaming progresses from the bar-stitches toward the middle of the length of the buttonhole, and consequently a gradual widening of the stitches as the feed progresses from the middle to the opposite end of the buttonhole, and for the reason that the action of a continuously-operative controller holds the cut edge of the material inclined to the cloth-plate until the needle-point has penetrated the material, the extent of such movement depending upon the firmness of the material, the result being a gradual drawing of the plies forming the material to be buttonholed away from the middle line of the buttonhole-slit and the producing of imperfect and objectionable work. Moreover, it is essential that during the automatic cutting of the buttonhole-slit the needle-thread shall be controlled so as to prevent its slack from getting in the path of the descending cutter.

This invention has for its object the protecting of the needle-thread from the danger herein pointed out and to remedy the defect in the alinement of the depth stitches.

I do not mean to say it is detrimental to the overseaming of the two sides of the buttonhole that at any time during the formation of the stitch the edges of the material forming the buttonhole-slit should be lifted from the throat or cloth plate, for such a movement is essential to the laying of what is termed the "purl-stitch" on the inner edges of the severed material, and such condition exists at the time the take-up is finishing each edge stitch adjacent to the cut portion of the material and tends to draw the lock or purl to the desired position; but such tension of the needle-thread is released before the needle-point in its descent reaches the material, per-

mitting the material to drop back upon the cloth or throat plate so that the needle-point does not pierce the material while the latter presents an inclined surface.

5 For the purpose of this case I have illustrated and described the construction and operation of my invention in combination with so much of the buttonhole feeding and sewing mechanism illustrated and described
10 in my pending application, Serial No. 639,400, and in connection with so much of the cutting mechanism shown and described in United States Patent No. 581,031, granted April 20, 1897, as is necessary to show an operative com-
15 bination, to which application and patent reference will be hereinafter made.

In the accompanying drawings, illustrating my invention, in the several views of which like parts are similarly designated, Figure 1
20 is a perspective view looking toward the rear, showing an automatic buttonhole cutting and sewing machine constructed and combined as shown and described by the reference patent and pending application above referred to and
25 with my thread-controlling device attached to the cutter-carrying bar. Fig. 2 represents a finished buttonhole. Fig. 3 represents a partially-overseamed faulty buttonhole, showing the material lifted from the throat-plate
30 by the tension given the needle-thread due to the action of a continuously-operative controller. Fig. 4 represents a faulty finished buttonhole, showing the variation in the length of the overseam-stitches due to the
35 tension given the needle-thread by the action of a controller operative every time the needle-point enters the material. Fig. 5 is a perspective view, partly like Fig. 1, showing a modification. Fig. 6 is a perspective view of
40 a lever to be described. Fig. 7 is a side elevation of sufficient of a sewing-machine to show the needle-thread in its passage from the spool to the needle. Fig. 8 is a perspective view showing the slack or loop of needle-
45 thread which it is one object of my invention to control. Fig. 9 is a view similar to Fig. 8, showing my invention in use.

Referring to Fig. 1, the bed-plate A, the portion B of the under member of the cloth-
50 clamp, the cross-slide b' , stationary guideway b^2 , and the adjustable guideway b^3 for the cloth-clamp slide-frame b^4 , the connecting-link b^{13} , the vibrating lever C, with its auxiliary lever c , the vibrating lever stud c^2 , the
55 gear-wheel d' , with its cam-groove d^3 , the spindle or stud b^{16} , the slide-bar d^4 , the shouldered screw d^5 , the pivoted lever d^{10} , the roller-screw x , the adjusting-stud d^{11} , the lever d^{12} , the screw d^{13} , the link d^{14} , the springs $c^6 c^6$,
60 the screws $c^8 c^8$, the adjusting-screws $c^9 c^9$, anti-friction-roller S, and the adjusting-screws $c^{10} c^{11}$ are in construction and function similar to the parts designated by like characters in my application, Serial No. 639,400, above re-
65 ferred to. From a comparison of Fig. 1 with my said application it will be readily understood that the gear-wheel d' derives its step-

by-step rotary motion in the direction indicated by the arrow t through its connection with the pawl-actuated ratchet-wheel mounted on the spindle b^{16} . 70

Referring to Fig. 1, the cutter-bar rock-shaft 1, its crank-arm 2, the cutter-bar collar 3, the cutter-bar 4, excepting as hereinafter explained, and its attached cutter 5, the
75 hooked collar or depressor 6, fast on the needle-bar rock-shaft 7, the collar 81, fast on the cutter-bar rock-shaft 1, the latch 9, pivoted at 10 to the collar 81, the spring 11, the stop-pin 12, the spring 13, the spring-collar 14, the
80 collar 15, the stop-finger 16, the spring 17, the lever 18, the pivot-screw 19, the stop-pins 20 and 21, the flat spring 22, the collar 23, and its pin 24 are in their construction and operation similar to the corresponding parts shown
85 and described in said Patent No. 581,031, but otherwise therein designated.

The stitch-forming mechanism, frame, and overhanging arm herein shown and described are such as are employed in the pending ap-
90 plication and United States patent herein referred to and comprise the well-known Wheeler & Wilson D¹⁰ sewing mechanism commonly used in connection with their well-known buttonhole-machines. 95

The manner of attaching the knife-clamp to the lower end of the cutter-bar, as herein shown and described, differs somewhat from the manner shown and described in United
100 States Patent No. 581,031, in that an adjustable collar 25 is employed to adjust the clamp vertically with relation to the cutter-bar; but such change in construction comprises no part of my present invention.

The throat-plate 26 is of the construction
105 commonly employed in connection with the well-known Wheeler & Wilson automatic buttonhole sewing and cutting machine and its details of construction are set forth in United States Patent No. 367,315, granted
110 July 26, 1887.

From the foregoing it will be understood that to connect operatively the cutting mechanism shown and described in United States
115 Patent No. 581,031 with the cloth-actuating mechanism shown and described in my application, Serial No. 639,400, it is necessary to connect operatively the lever 18 with some part of the cloth-actuating mechanism, so that at the proper time in the overseaming
120 of the buttonhole the cutter will be automatically actuated to cut the buttonhole-slit. To accomplish this result, a lever 27 is attached to the adjustable way b^3 by a pivot-screw 28 and held in the direction indicated
125 by the arrow u by a suitably-coiled spring (not shown) located in the adjustable way b^3 and encircling the screw 28, positioned to operate in the usual manner. The lever 27 is constructed with two extending arms, the
130 arm 29 positioned to coact with the lever 18 and an arm 42 extending in the opposite direction, or nearly so, and under the edge of the gear-wheel d' , so that the roller-stud 30,

rotating with the gear-wheel d' , will strike the unexposed arm of the lever 27, causing the arm or extension 29 to act upon the lever 18 and effect the automatic operation of the cutter in the same manner as if said lever 18 had been actuated by the movement of the cross-slide N, as pointed out in Patent No. 581,031.

Having sufficiently described the details of construction and operation of the cutting and cloth-feeding mechanisms to show an operative combination, I will now proceed to describe in detail the construction and mode of operation of my temporarily-actuated thread-controller.

As previously stated, a continuously-operative thread-controller is detrimental to a perfect production; but a controller operated coincidentally with the descent of the cutter is essential, and to accomplish this temporary control of the needle-thread some temporarily-actuated portion of the machine must be employed. It so happens that in the construction represented herein the vertical movement of the cutter-bar is, in time and extent of movement, a suitable means to effect the desired control.

It is not my intention to limit my invention to the particular mounting of the thread-controller finger as herein shown and described, since a cutter-bar having substantially more or less throw than the cutter-bar herein illustrated and described might demand the mounting or connecting of the controller-finger upon or with some other part of the actuating mechanism.

In one form of my thread-controller, Fig. 1, I employ an adjustable collar 31, mounted on the cutter-bar 4 and supporting a controller finger or wire 32, which in its descent carries the needle-thread 33 down below the thread-guide 34 sufficiently to control the slack thread, which otherwise would be liable to be severed by the descending cutter.

In Fig. 5 I have shown a controller wire or finger 32^a, suitably secured to the cutter-bar rocker-shaft 1, which form of construction would greatly increase the extent of movement of the outer or effective portion of the finger, and in some constructions of stitch-forming mechanism might better accomplish the desired result than the employment of the cutter-bar.

The thread-guide 34 is constructed with an arm 35, extended upward far enough to permit of the descent of the controller-wire under all conditions of adjustment. The thread-guide 34 here shown is of substantially the same construction as that common to the Wheeler & Wilson D¹⁰ sewing-machine, and its form of construction is illustrated in the

United States patent referred to, No. 581,031, Figs. 1 and 2, but not designated by figure or letter.

In Fig. 7 I have shown the common devices for conducting the needle-thread under tension from the spool to the needle and have omitted other parts of the mechanism not material to this illustration. D is the spool from which the thread passes to the thread-check E, thence to the tension device F, thence to the take-up G, and thence through the thread-leaders H to the guide 34 and to the needle. Without my thread-controller a loop of thread K, Fig. 8, would be formed which would be in the path of the descending cutter; but, as already described, my controller, as shown in Fig. 9, bends the thread and takes up the slack and so prevents the formation of the loop K in the path of the descending cutter, or, in other words, removes the thread from danger of being severed by the cutter.

What I claim is—

1. In a buttonhole-sewing machine, the combination of a thread-controller comprising a reciprocating finger and suitable thread-guides, a cutter, cutter-actuating mechanism, a cloth-clamp and actuating mechanism therefor, and means interposed between the thread-controller finger and the cloth-clamp-actuating mechanism, whereby the cloth-clamp-actuating mechanism controls the action of the thread-controller finger at proper intervals to take up the slack in the needle-thread as the cutter descends, substantially as described.

2. In a buttonhole sewing and cutting machine, a cutter, a cutter-actuating mechanism, a thread-controller comprising a reciprocating finger and suitable thread-guides, and a depressor operated by the needle-actuating mechanism, whereby said thread-controller finger is actuated to take up slack in the needle-thread as the cutter descends, in combination with a cloth-feeding clamp and stitch-forming mechanism, substantially as described.

3. In a buttonhole sewing and cutting machine, a stitch-forming mechanism, feed mechanism, a thread-tension, a take-up, a thread-guide, thread-leaders and a reciprocating cutter, combined with a thread-controller finger and means to actuate it coincidentally with the descent of the cutter to bend the needle-thread and clear it from the path of the descending cutter, substantially as described.

In testimony whereof I have hereunto set my hand this 25th day of July, A. D. 1898.

FREELAND W. OSTROM.

Witnesses:

B. C. HAMILTON,
A. W. DAVENPORT.