

No. 742,492.

PATENTED OCT. 27, 1903.

T. O. QUIST.

CUTTER CONTROLLING MECHANISM FOR BUTTONHOLE SEWING MACHINES.

APPLICATION FILED APR. 11, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

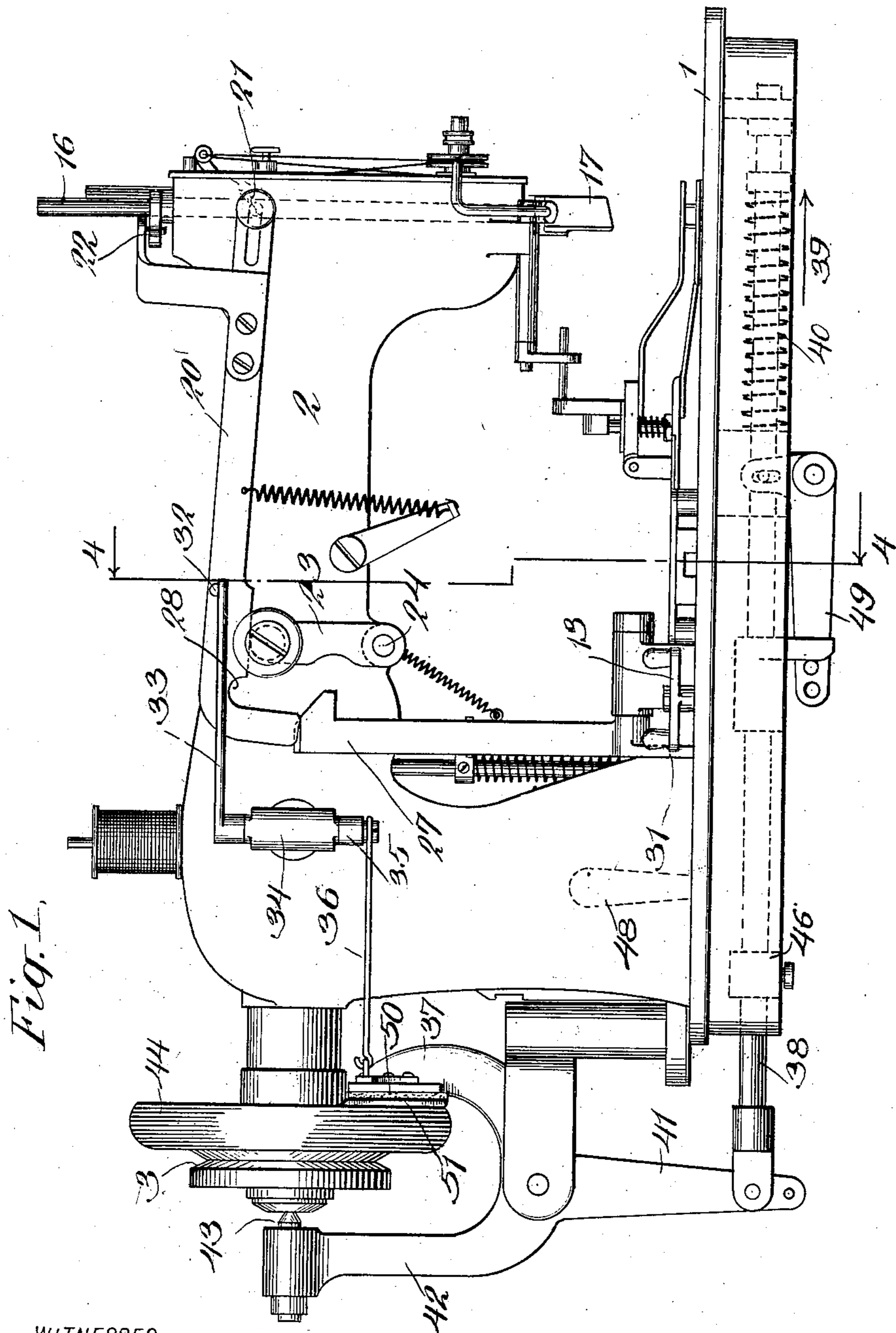


Fig. 1.

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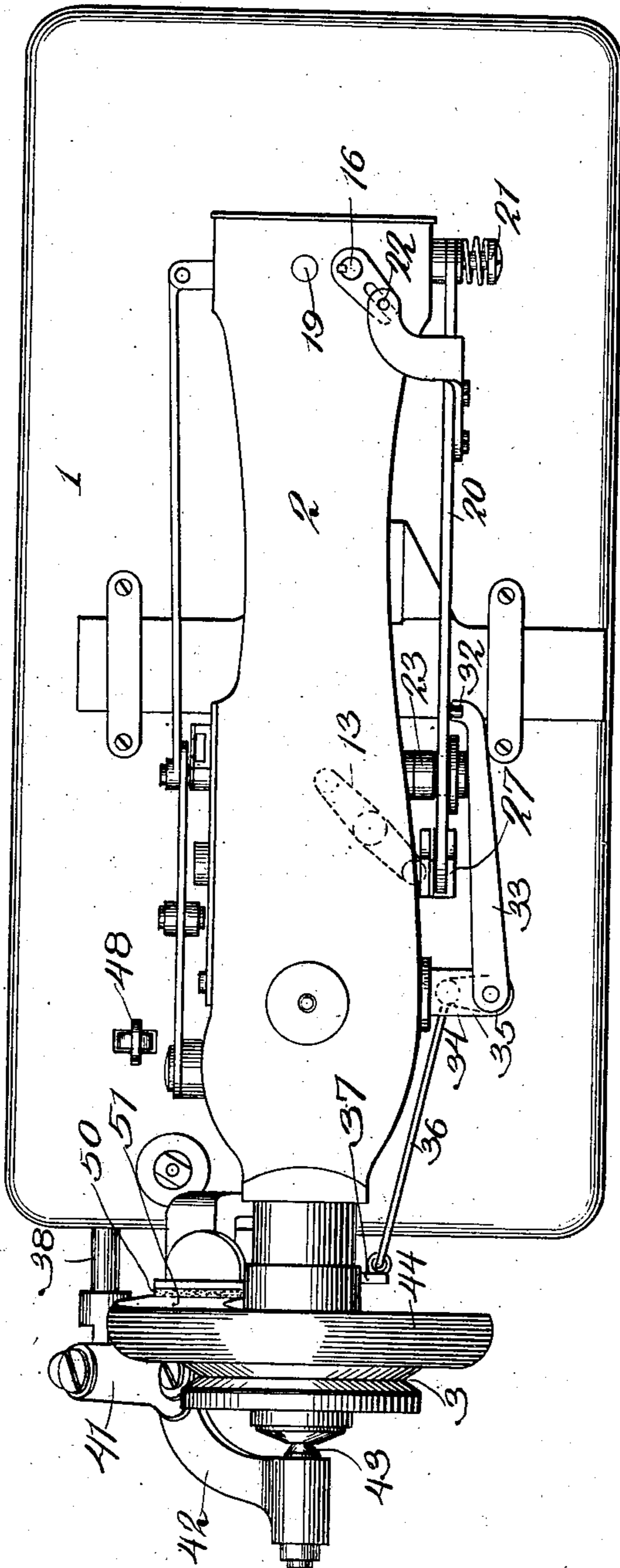
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NO MODEL.

4 SHEETS—SHEET 2.

Fig. 2.



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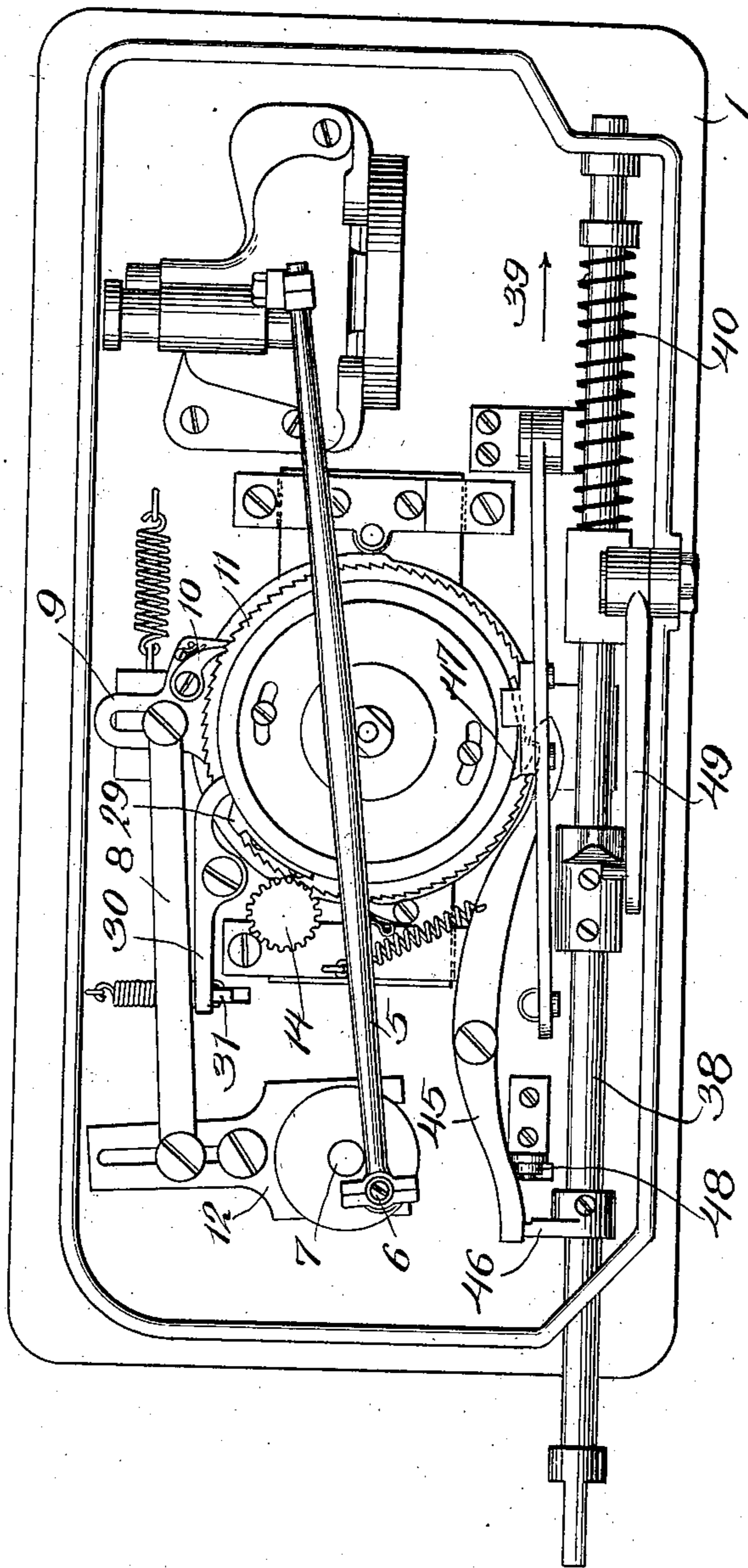
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NO MODEL.

4 SHEETS—SHEET 3.

Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 5,

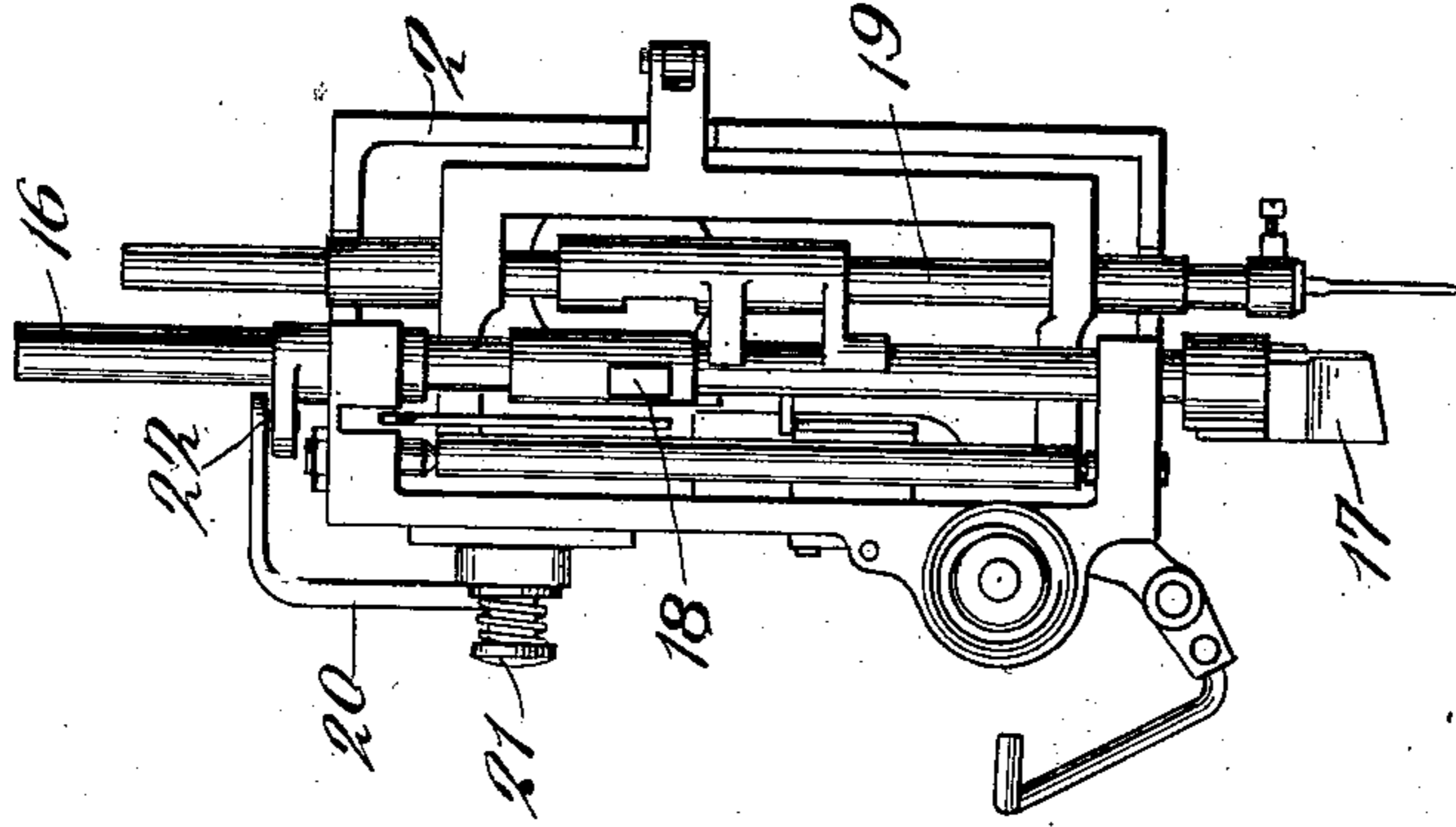
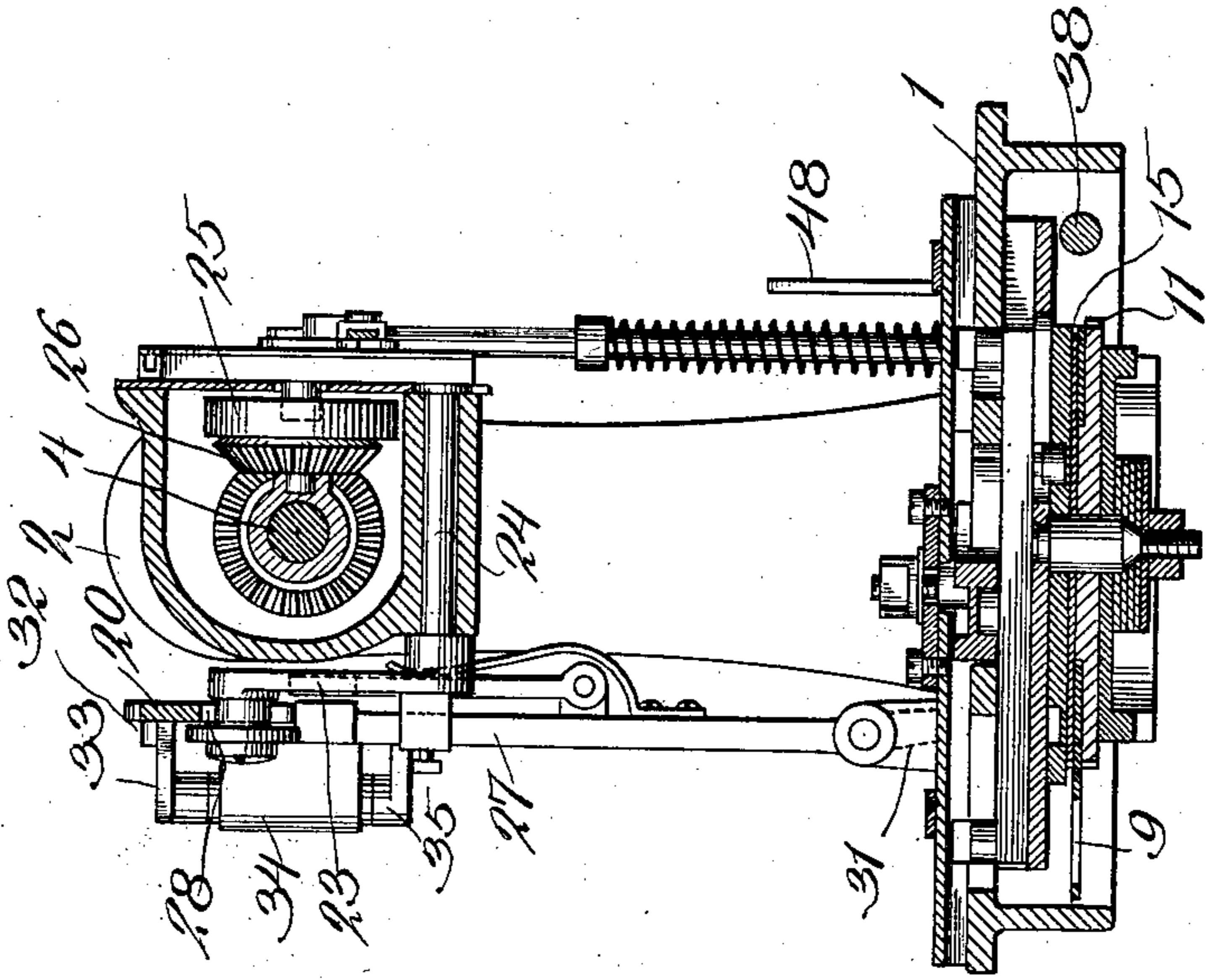


Fig. 4,



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UNITED STATES PATENT OFFICE.

THORVALD O. QUIST, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE
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CUTTER-CONTROLLING MECHANISM FOR BUTTONHOLE-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 742,492, dated October 27, 1903.

Application filed April 11, 1903. Serial No. 152,102. (No model.)

To all whom it may concern:

Be it known that I, THORVALD O. QUIST, a citizen of the United States of America, residing at Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Cutter-Controlling Mechanism for Buttonhole-Sewing Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to sewing-machines, and particularly to buttonhole-sewing machines.

My invention consists, essentially, in the provision of means for throwing the cutter employed in this class of machines out of operative relation with its operating mechanism upon the stopping of the machine, so that should the mechanism which ordinarily governs the time of cutting be operated by hand and the cutting-point be reached and passed the cutter will fail to operate until the predetermined cutting-point is again reached in the normal operation of the machine.

The object of my invention is to avoid cutting at a wrong point in the operation of the machine, and particularly after stopping and again starting up the machine.

In buttonhole-sewing machines of the type to which my invention is particularly adapted the buttonhole-stitching mechanism, the work-feed, and the cutter are all connected together to operate in timed relation with each other during the normal running of the machine. The stitching mechanism and the work-feed are arranged to operate synchronously, and the tripping mechanism, which is timed by the work-feed mechanism, brings the cutter into operative relation with its operating mechanism at a predetermined point in its movement. Means are provided, however, for independent manual operation of the work-feed independently of stitching mechanism when the main drive of the machine is stopped, and during such manual operation of the work-feed the tripping-point of the cutter is liable to be reached and passed. In such case if the tripping mechanism were not reset by hand the cutter would be oper-

ated upon again starting up the machine regardless of the position of the work-feed. The result of this would be that the cutter, unless the work-feed happened to be in exactly the correct position, would come down and cut the goods in the wrong place or would be stopped by some portion of the work-clamp and be injured thereby. To obviate the foregoing, I have provided a means controlled by the stop-motion of the machine for rendering the cutter-tripping mechanism inoperative, so that when the machine is stopped and the work-clamp manually operated the tripping mechanism will fail to bring the cutter into operative relation with its driving mechanism even though the cutting-point be reached and passed.

I will now proceed to describe a sewing-machine embodying my invention and will then point out the novel features in claims.

In the drawings, Figure 1 is a rear elevation of a sewing-machine embodying my invention. Fig. 2 is a top view thereof. Fig. 3 is an under side view of the same. Fig. 4 is a view in transverse section thereof, the plane of section being taken upon the line 4-4 of Fig. 1. Fig. 5 is a detail end view of the arm of the machine, showing particularly the cutter-supporting mechanism and certain portions of the mechanism for actuating same.

This sewing-machine herein illustrated comprises the usual bed 1 and arm 2 of a machine of this character. The driving mechanism includes a main driving belt-wheel 3, mounted upon a horizontal drive-shaft 4, journaled in the said arm 2 of the machine. The stitching mechanism and work-feed mechanism are both driven by connection with the drive-wheel 3 during the normal running of the machine, the needle-bar reciprocating mechanism by connection with the horizontal shaft 4, the shuttle or stitching-forming mechanism by connection with the connecting-rod 5, connected to the crank-pin 6, mounted to rotate upon a vertical shaft 7, geared to the horizontal shaft 4, and the work-feed by means of a vibrating link 8, connected at one end with a plate 9, carrying a feed-pawl 10, engaging the teeth of a feed-

wheel 11, said vibrating link connected at its other end to a rocking lever 12, actuated by a cam or eccentric upon the vertical shaft 7.

Means are provided for operating the work-feed mechanism independently of the stitching mechanism and independently of the normal drive of the machine by the provision of a handpiece 13, connected to a pinion 14, which engages the teeth of a gear-wheel 15, secured to the feed-wheel 11. By manual operation of the handpiece 13 the feed-wheel may be caused to rotate in its feeding direction, being permitted to do so by the slipping of the ratchet-teeth of its feed-wheel beneath the feed-pawl 10. The stitching mechanism and work-feed mechanism in this application form no part of this present invention. Hence I will not explain them in further detail herein. They are illustrated and fully described in detail in United States Patent to J. T. Hogan, No. 648,870, dated May 15, 1900. It will be sufficient for purposes of this specification to merely call attention to the fact that the two mechanisms are connected to operate synchronously in the ordinary running of the machine, but that the work-feed as just described may be freely operated independently of the other mechanism when desired.

The cutting mechanism herein shown is similar to that described and illustrated in detail in United States Patent to J. O. Osterhout and J. P. Hallenbeck, No. 402,610, dated May 7, 1889, and *per se* forms no part of this invention. Briefly it comprises a cutter-bar 16, supporting a cutter 17 at its lower end and mounted to reciprocate vertically in suitable bearings in the end of the arm 2 of the machine. The bar 16 is provided with a lug 18, which when the cutter is shifted to a cutting position is adapted to be engaged by a notch in the needle-bar 19 and be reciprocated therewith. The cutter-bar 16 is shifted to the cutting position through the medium of a controller 20, pivoted at 21 upon the arm and connected to the cutter-bar by a pin-and-slot connection 22. A rocker-arm 23, mounted upon the rock-shaft 24, reciprocates in the ordinary running of the machine, the rock-shaft 24 being operated by a cam 25, geared through bevel-gearing 26 (see Fig. 4) with the drive-shaft 4, said shaft being the member which transmits a jogging movement to the needle-bar in a manner well known. The rear end of the controller 20 rests normally upon the tripping-arm 27 and is supported thereby, so that the rocking movement of the arm 23 does not effect any movement of the controller. At a predetermined point in the operation of the machine, however, the tripping-arm 27 is moved from beneath the controller, and upon the rocking arm 23 moving to its rearmost position the controller 20 is permitted to fall and be engaged thereby in its slotted portion 28, so that upon forward movement of the rocking arm 23 the controller 20 will be moved forward to shift the cut-

ter-bar 16 and cutter 17 to the cutting position. The tripping-bar 27 is controlled in its movements by controlling means comprised in a cam projection 29, carried by the feed-wheel 11, a rocking lever 30, arranged to be engaged thereby, and an arm 31, secured to the tripping-arm 27 and arranged to engage the lever 30. The position of the cam projection 29 upon the feed-wheel 11 determines the point at which the tripping mechanism will act, and hence the point at which the cutter will be brought into operation. It will be seen, therefore, that so far if the normal drive of the machine be stopped and the feed-wheel be rotated by hand as far as the cutting position the cutting mechanism will be tripped. As the cutter is always brought into operation upon the next successive stroke of the stitching mechanism, it will then follow that when the machine is again started up the cutter will at once be actuated even though the feed-wheel has been moved considerably past the cutting-point and the work and work-clamp not in a proper position to receive the cut. It is to obviate the foregoing that I have provided means for rendering the tripping action of the cutter mechanism inoperative when the machine is stopped, so that even though the tripping mechanism be actuated by the feed-wheel during its manual operation the cutter mechanism will not be actuated upon again starting up the machine until the cutting-point is again reached. I have provided the controller 20 with a pin or projection 32, and I have provided a swinging detent 33, arranged to be moved to a position beneath the pin 32, so as at such times to prevent movement of the controller 20 even though the tripping-arm 27 be moved from beneath said controller. The detent 33 is pivotally mounted upon a bracket 34, secured to the arm 2, and a lever 35 is secured to the said detent and is connected, by means of a link 36, with a moving member 37 of a stop-motion employed. The stop-motion comprises a horizontally-shifting bar 38, mounted in slide-ways beneath the base-plate 1 of the machine, and is spring-pressed in the direction of the arrows 39 at Figs. 1 and 3 by means of a spring 40. The bar 38 is connected to the member 37 by pivotal connection with an arm 41, forming a portion of said member. Another arm 42 carries a cone-point 43, which engages the driving belt-wheel 3. The drive-wheel 3 is loosely mounted upon the horizontal shaft 4, while a disk 44, mounted in proximity thereto, is rigidly mounted upon said shaft. When the shifting rod 38 is moved in the direction opposite to the arrows 39 and against the tension of the spring 40, the moving member 37 is rocked upon its support and the drive-pulley 3 is forced toward the disk 44, so as to maintain driving connection between them. The bar 38 is held in this position by means of a tripping-lever 45, which at such times is caused to engage with a collar 46, carried by the said rod. The tripping-bar 45 may be op-

erated automatically by a cam projection 47, carried by the feed-wheel 11, and a hand-lever 48 is also provided, so that the tripping mechanism may be manually operated at any moment desired. A resetting-lever 49 may be employed for resetting the stop-motion after it has been tripped. In the drawings the cutter mechanism is shown in its tripped position. When the stop-motion is tripped either automatically or by manual operation of the lever 48, the tripping-lever 45 will be disengaged from the collar 46 and the rod 38 moved in the direction of the arrows 39 by the spring 40, thereby rocking the moving member 37 upon its pivotal support and disengaging the drive-wheel 3 from driving connection with the disk 44 and causing a brake-shoe 50, carried by the member 47, to engage the opposite face of the disk 44 to positively stop same. The disk 44 is provided with a protuberance 51 at one point upon its face, so that the mechanism will always be stopped at a predetermined position in the rotation of the shaft 4. The moving member 37 will produce corresponding movements of the detent 33, so that whenever the stop-motion is tripped and the machine stopped the detent 33 will be moved to its position beneath the pin 32 on the controller 20, and the parts will be maintained in such position despite movements of the work-feed mechanism and the cutter-controlling cam 29 produced by manual operation until the stop-motion is again shifted for the restarting of the machine, when the detent 33 will be moved away from beneath the pin 32 and the parts permitted to operate as before.

It will be obvious that the foregoing is but one embodiment of my invention and that the same is capable of many and varied modifications within the spirit and scope of my invention and, further, that certain parts may be employed in connection with other parts of different construction. Hence I do not desire to be limited only to the precise details of construction and combination of parts herein.

What I claim is—

1. In a sewing-machine, the combination with buttonhole-stitching mechanism, a cutter, operating mechanism therefor, and tripping mechanism for throwing the cutter into operative relation with its operating mechanism, of means operated upon the stopping of the machine for rendering the tripping mechanism inoperative.

2. In a sewing-machine, the combination with buttonhole-stitching mechanism, a work-feed, and means for synchronously driving same, a cutter, and tripping mechanism for throwing the cutter into operative relation with its operating mechanism, of means, operating upon the stopping of the machine, for rendering the tripping mechanism inoperative, and means for operating the work-feed independently of its normal driving means.

3. In a sewing-machine, the combination with buttonhole-stitching mechanism, work-

feed mechanism, and means for synchronously driving same, a cutter, and means controlled by said work-feed mechanism for bringing said cutter into operation, of means permitting operation of the work-feed mechanism independently of the stitching mechanism, and means operated upon the stopping of the machine for rendering the cutter-controlling means inoperative during the said independent operation of the work-feed mechanism.

4. In a sewing-machine, the combination with buttonhole-stitching mechanism, a stop-motion, a cutter and cutter-controlling means, of means operated by the stop-motion for preventing operative action of the cutter-controlling means.

5. In a sewing-machine, the combination with buttonhole-stitching mechanism, a stop-motion, a cutter, cutter-controlling means, and means for operating the cutter-controlling means independently of the action of the stop-motion, of means operated by the stop-motion for preventing operative action of the cutter-controlling means.

6. In a sewing-machine, the combination with buttonhole-stitching mechanism, a stop-motion, a cutter, and operating mechanism therefor, of means controlled by the stop-motion for preventing operative engagement of the cutter with its operating mechanism.

7. In a sewing-machine, the combination with buttonhole-stitching mechanism, a stop-motion, a cutter, and a cutter-controller, of means operated by the stop-motion for preventing said cutter-controller from effecting operation of said cutter.

8. In a sewing-machine, the combination with buttonhole-stitching mechanism, a stop-motion, a cutter, and operating mechanism therefor, of means controlled by the stop-motion in its operation, for rendering the cutter-operating mechanism inoperative.

9. In a sewing-machine, the combination with buttonhole-stitching mechanism, a stop-motion, a cutter and tripping mechanism for throwing the cutter into and out of operative relation with its operating mechanism, of means controlled by the stop-motion when operated, for rendering the tripping mechanism inoperative.

10. In a sewing-machine, the combination with buttonhole-stitching mechanism, work-feed mechanism, a stop-motion, a cutter, and cutter-tripping mechanism normally operated by the work-feed mechanism, of means controlled by the stop-motion, when operated, for rendering the cutter-tripping mechanism inoperative.

11. In a sewing-machine, the combination with buttonhole-stitching mechanism, work-feed mechanism, a stop-motion, tripping mechanism therefor, a cutter, a cutter-controller, and tripping mechanism therefor, normally operated by the work-feed mechanism, of means, controlled by the stop-motion when tripped, for causing the cutter-controller to

be disengaged from operative relation with its tripping mechanism, and for maintaining it so disengaged, during the time said stop-motion is in its tripped position.

5 12. In a sewing-machine, the combination with buttonhole-stitching mechanism, and a cutter actuated by the stitching mechanism when in the cutting position, of means for moving the cutter to the cutting position, 10 tripping mechanism for rendering such means operative, a stop-motion, and means controlled by said stop-motion, when operated, for rendering the said tripping mechanism inoperative.

15 13. In a sewing-machine, the combination with buttonhole-stitching mechanism, and a cutter actuated by the stitching mechanism when in the cutting position, of means for moving the cutter to the cutting position, 20 tripping mechanism for rendering such means operative, work-feed mechanism including means for operating said tripping mechanism, a stop-motion, means controlled by said stop-motion, when operated, for rendering the said 25 tripping mechanism inoperative, and means

whereby said work-feed may be operated while the stop-motion is in its operated position, and the tripping mechanism inoperative.

14. In a sewing-machine, the combination 30 with buttonhole-stitching mechanism, a cutter and a cutter-controller, of means for driving the machine, a stop-motion therefor including a moving member, a detent arranged to engage the cutter-controller, and a con- 35 nection between the detent and the moving member of the stop-motion.

15. In a sewing-machine, the combination with buttonhole-stitching mechanism, a cutter and a cutter-controller, of means for driv- 40 ing the machine, a stop-motion therefor including a moving member, a detent arranged to be moved in the path of movement of the cutter-controller, and a connection between the detent and the moving member of the stop- 45 motion.

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Witnesses:

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