

No. 798,130.

PATENTED AUG. 29, 1905.

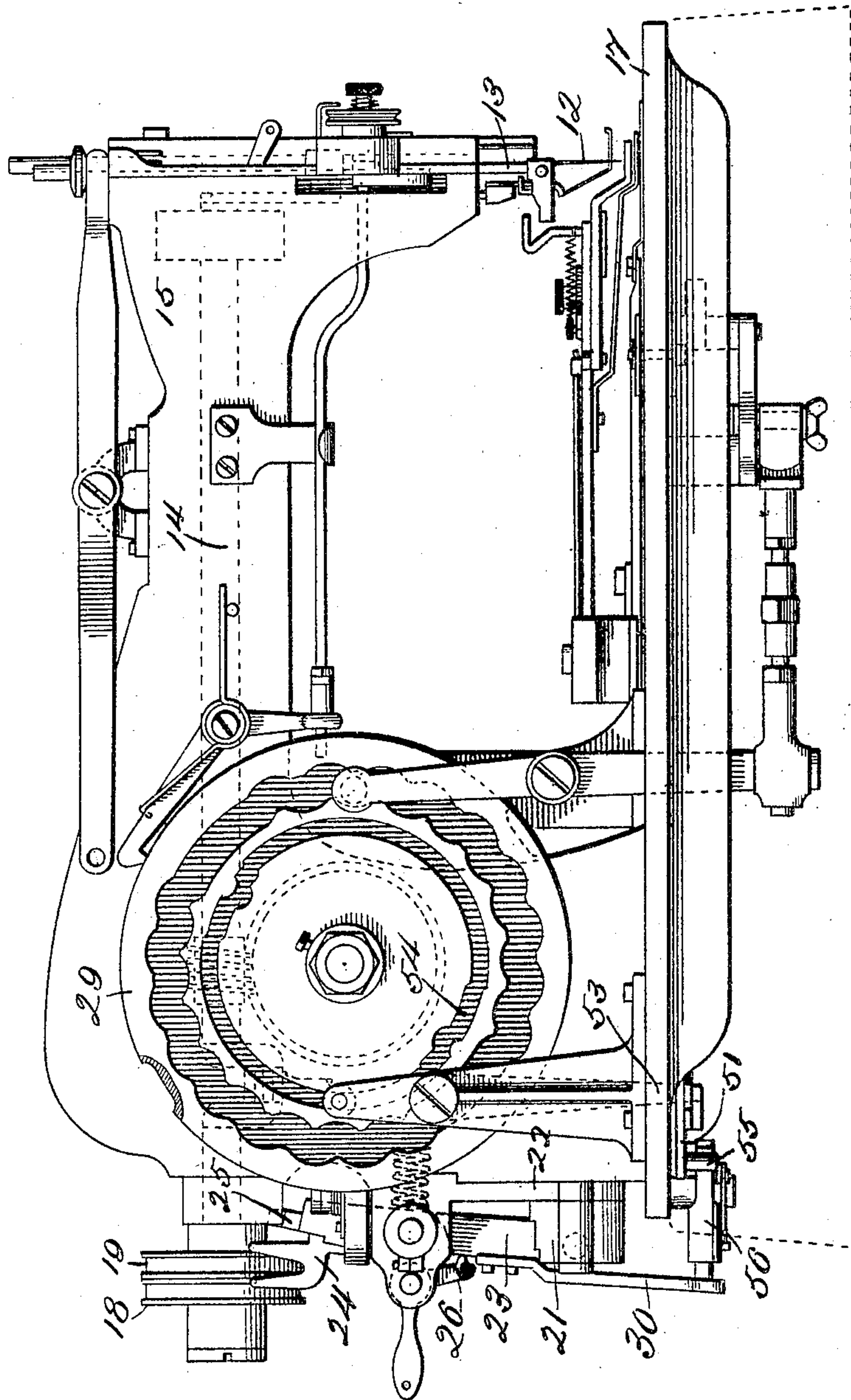
G. S. GATCHELL.

THREAD CUTTING AND HOLDING DEVICE FOR SEWING MACHINES.

APPLICATION FILED OCT. 1, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 2.

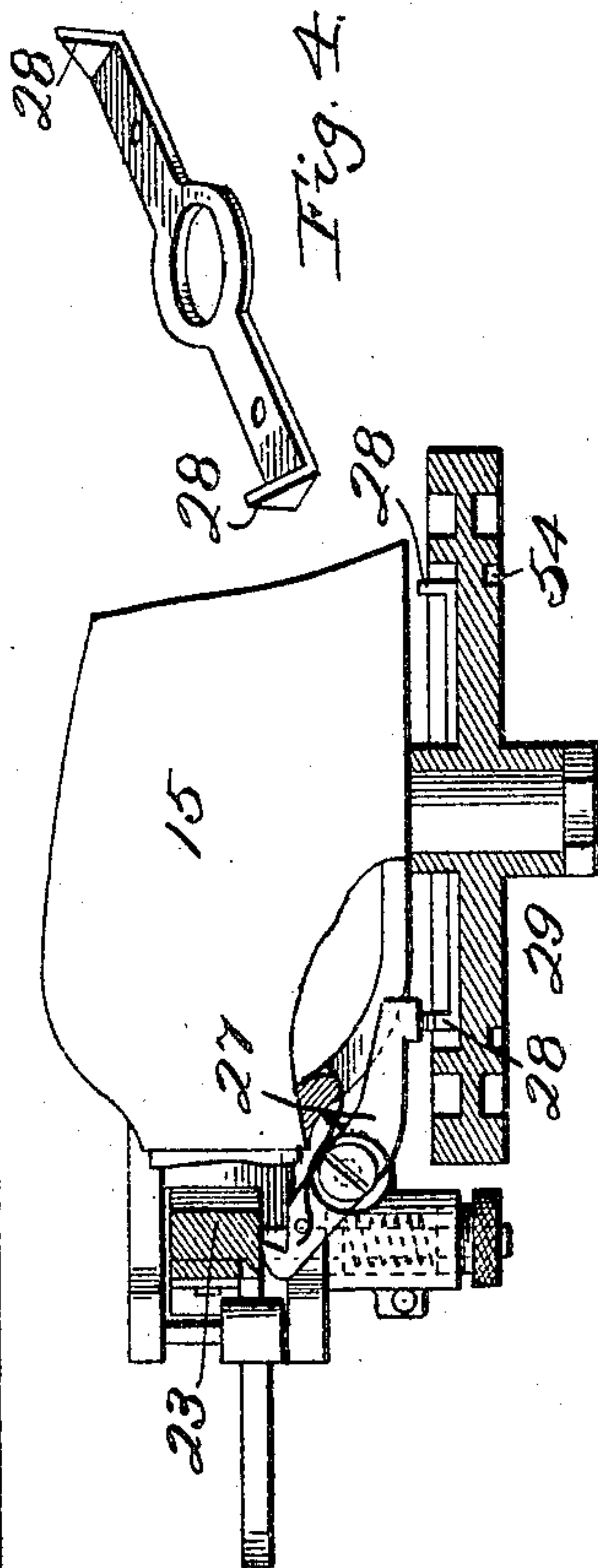
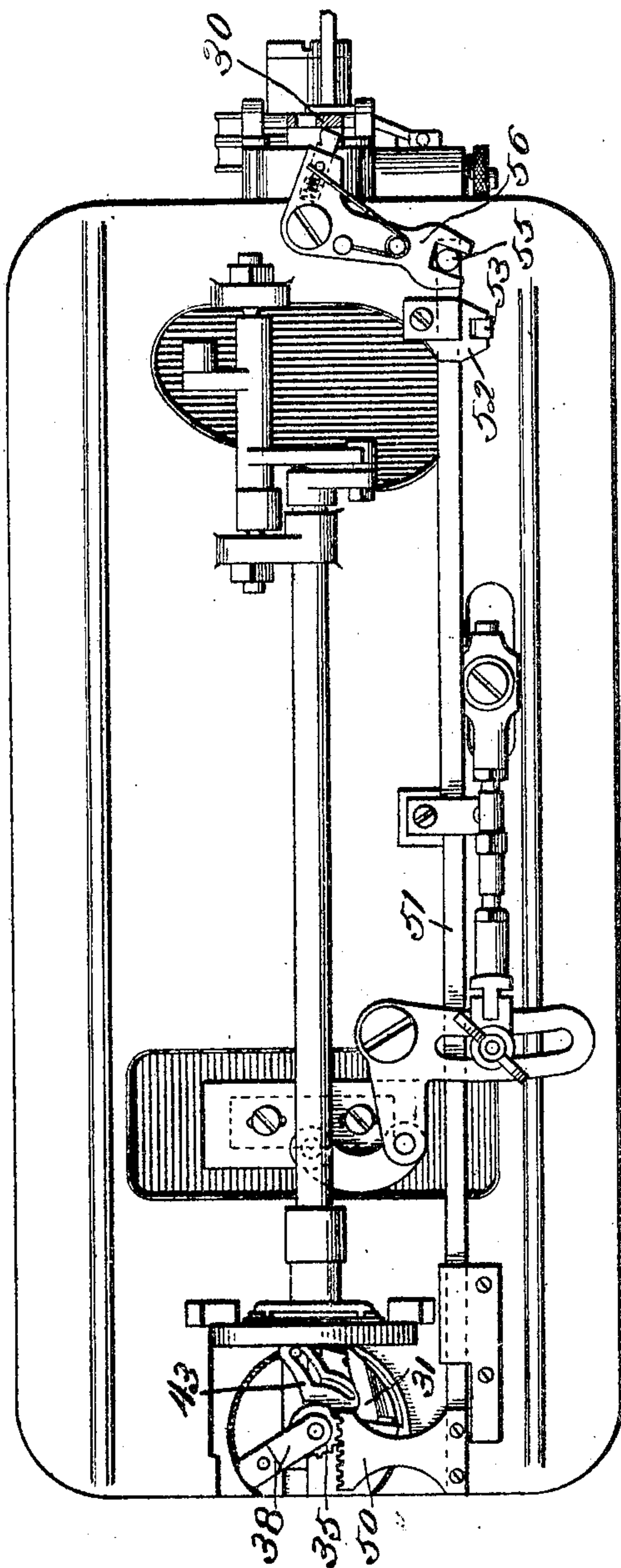


Fig. 3.

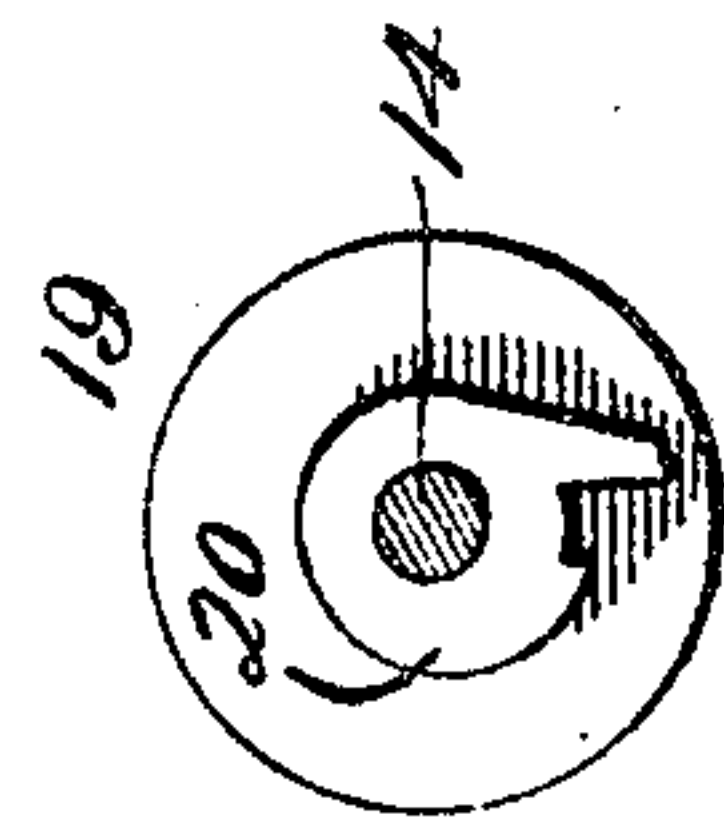


Fig. 5.

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4 SHEETS—SHEET 3.

Fig. 6.

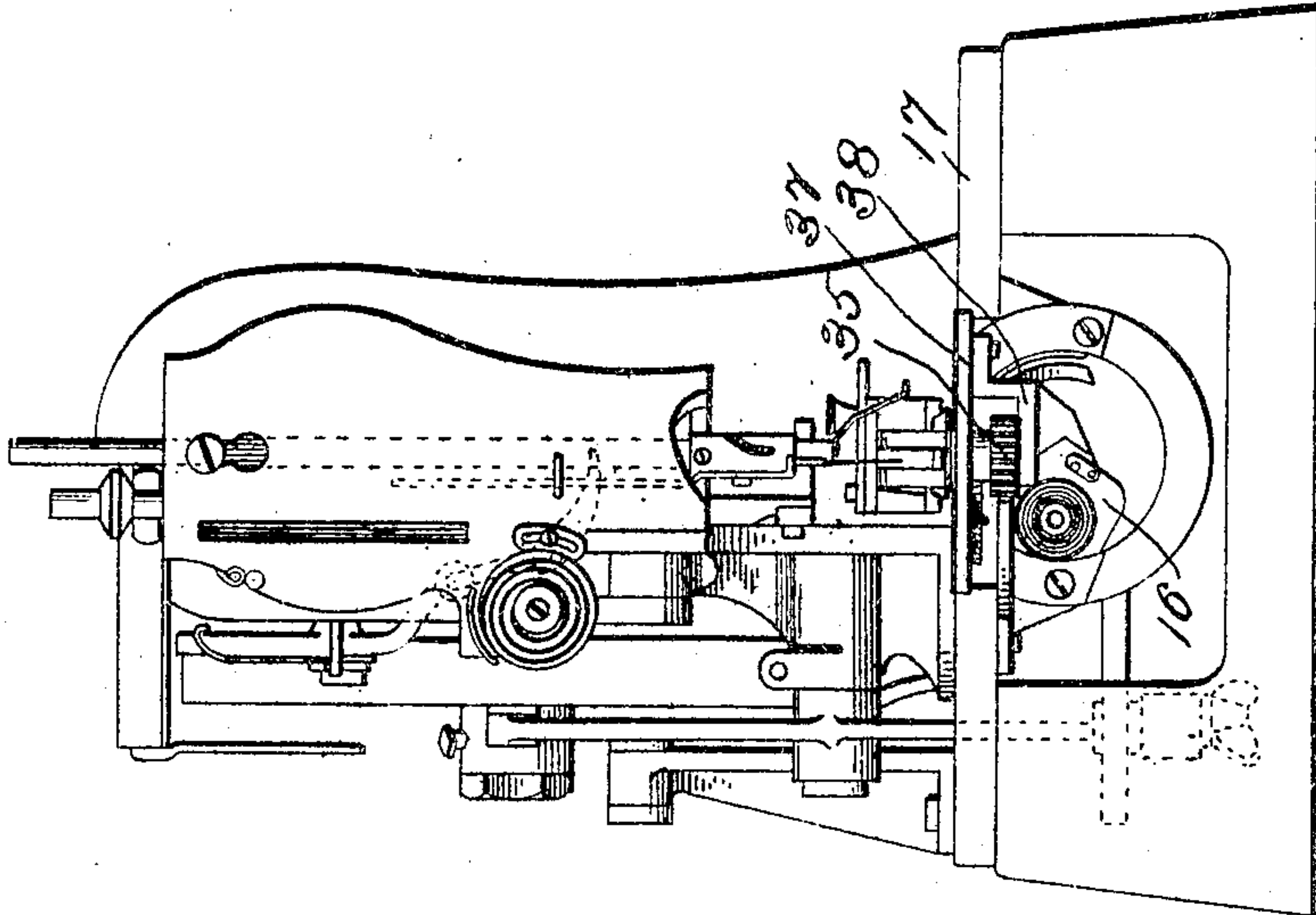
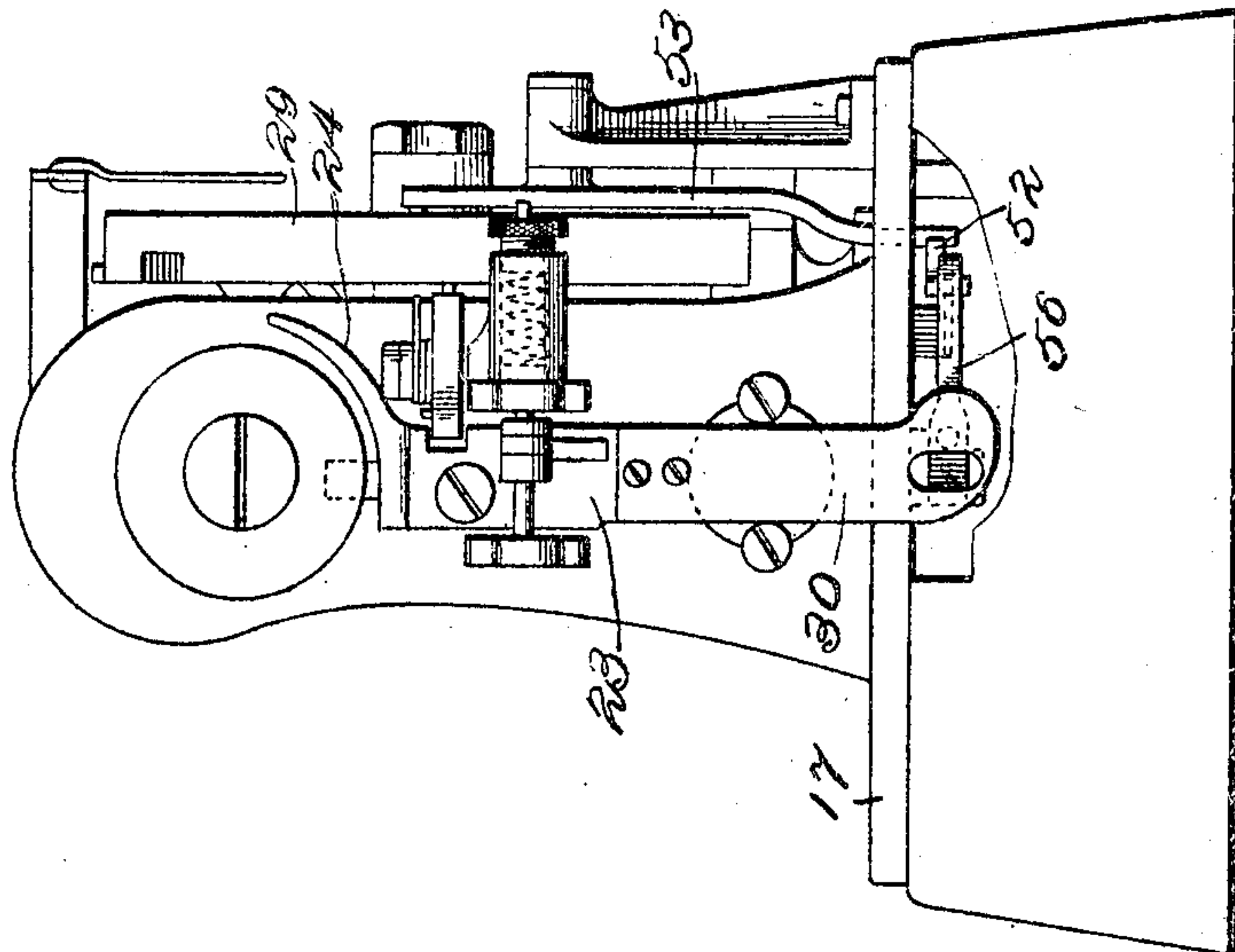


Fig. 7.



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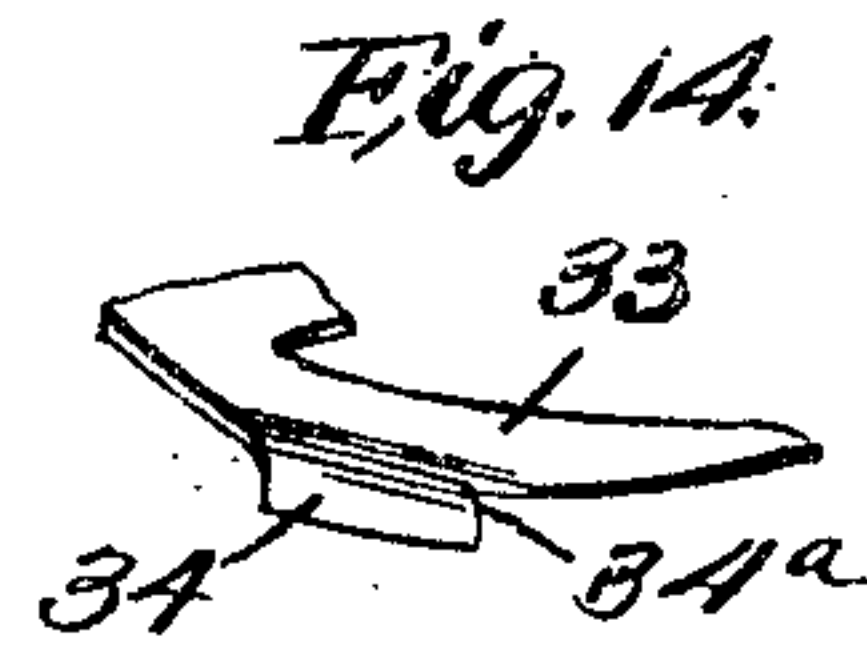
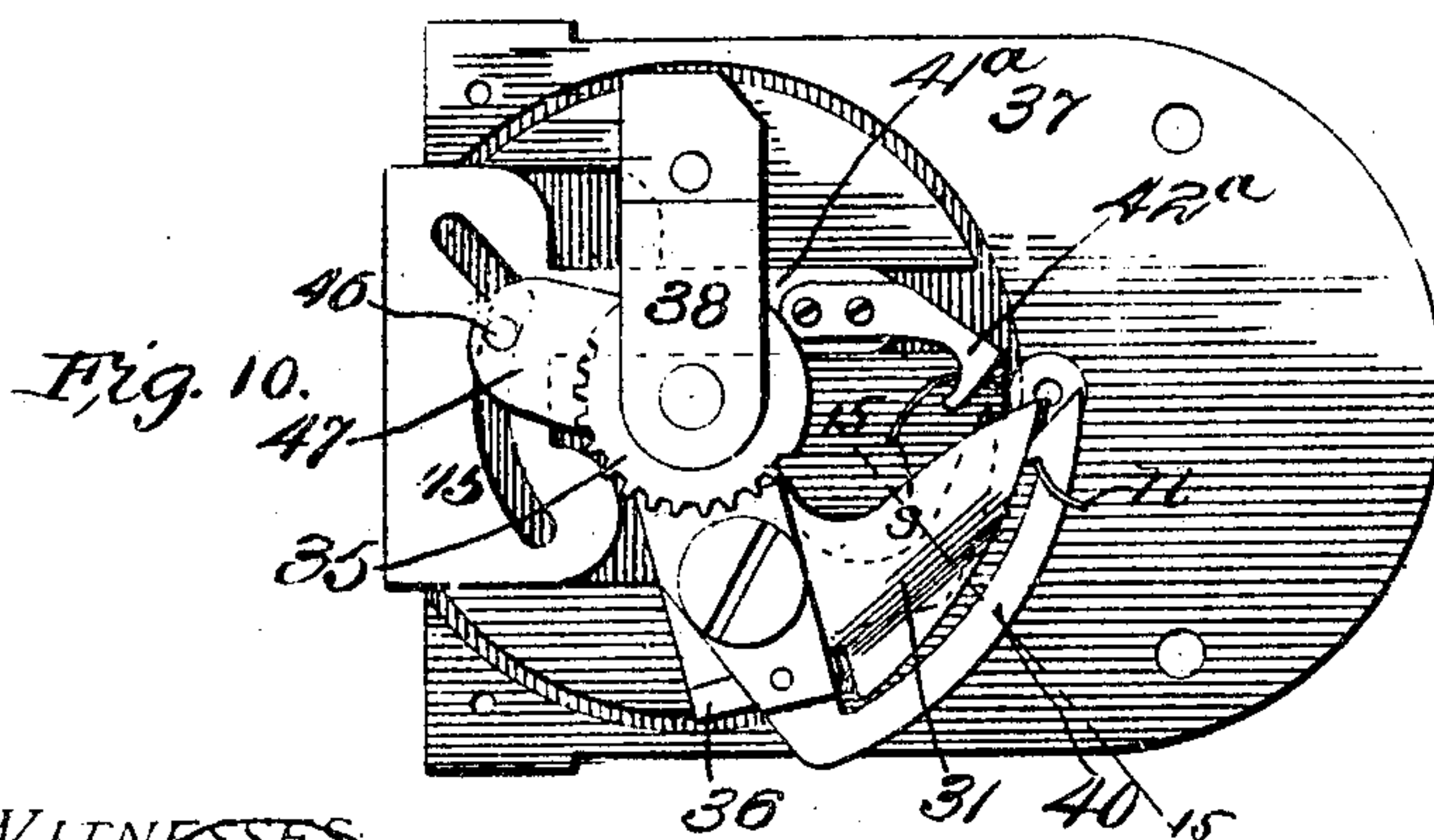
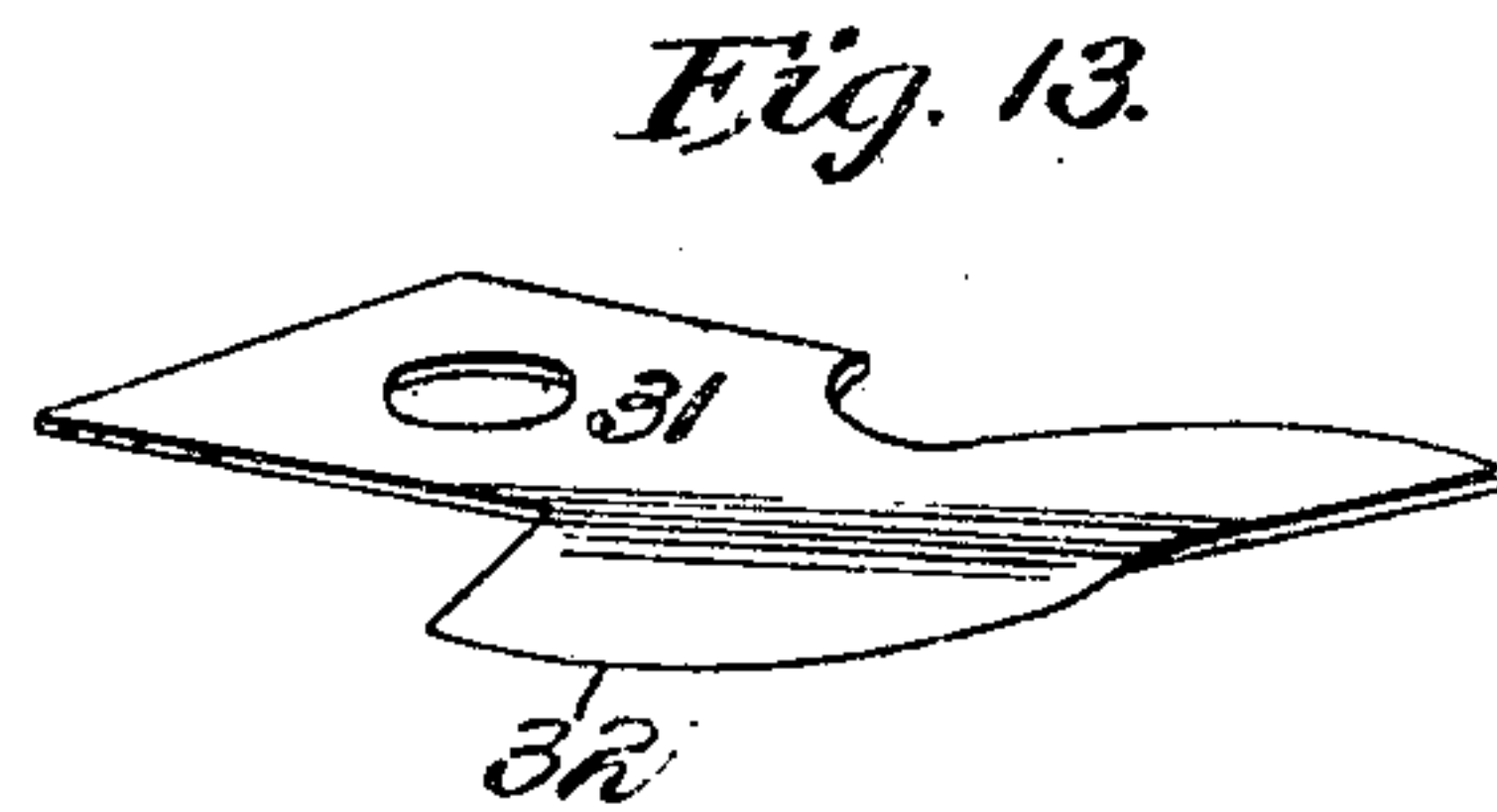
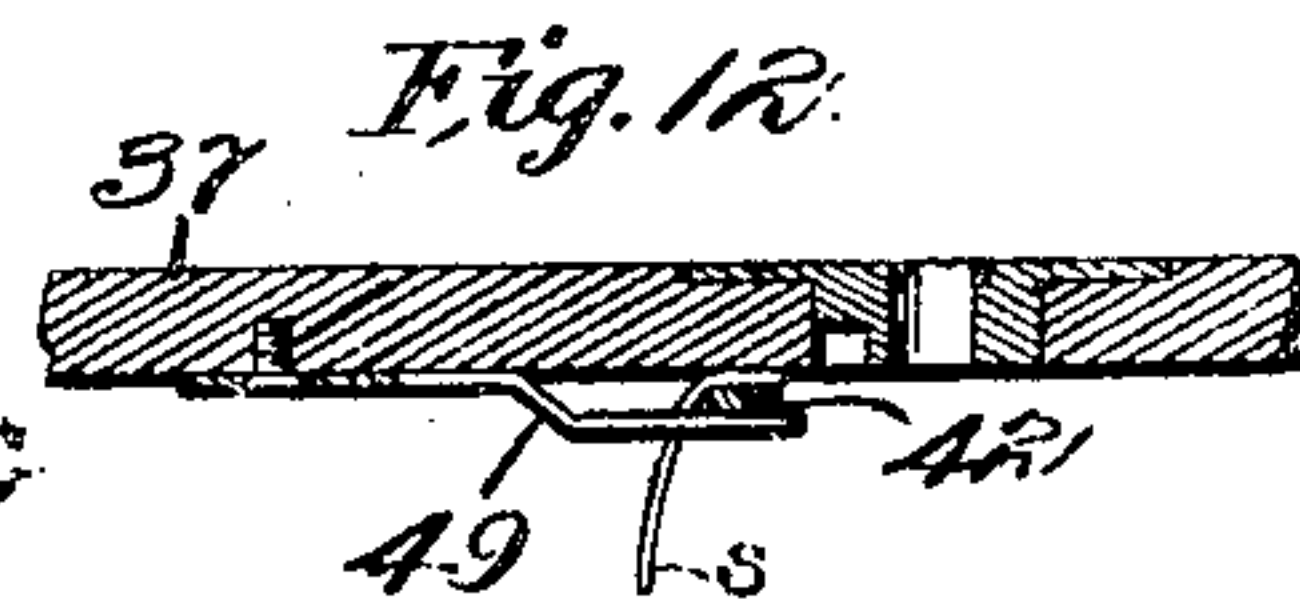
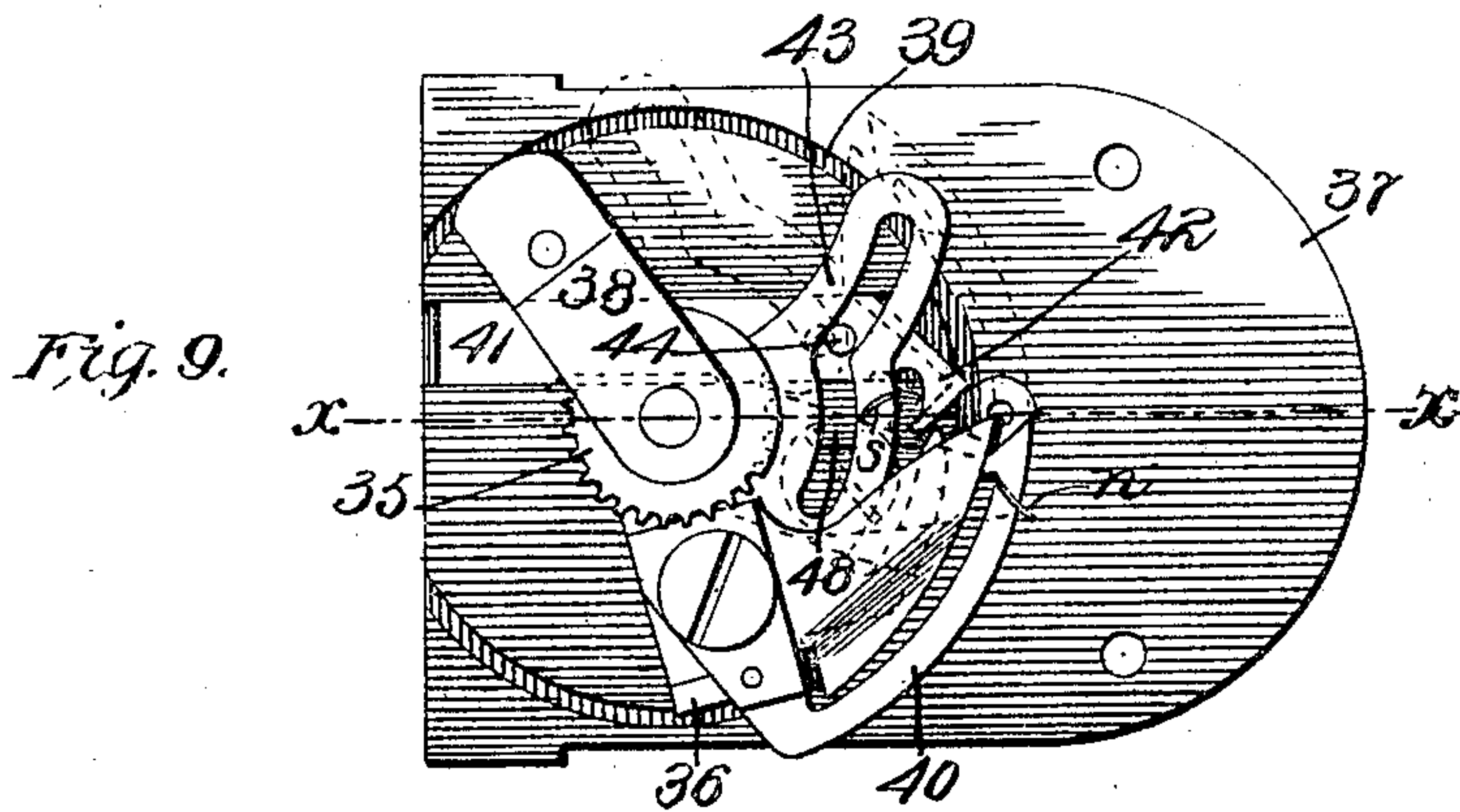
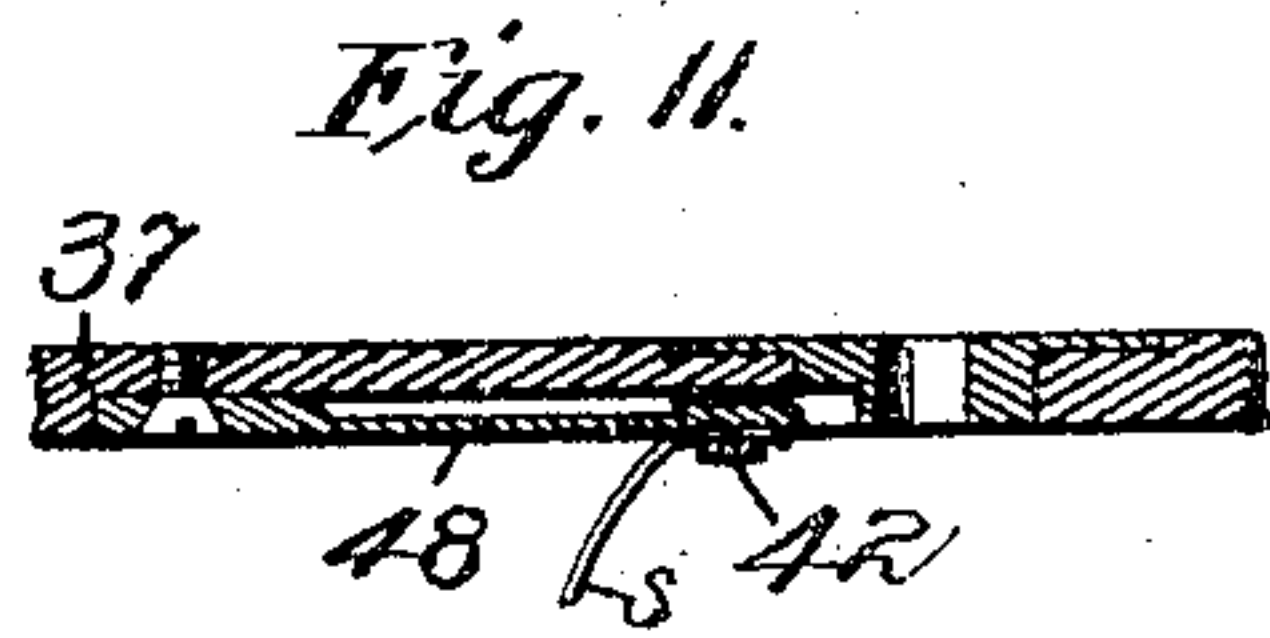
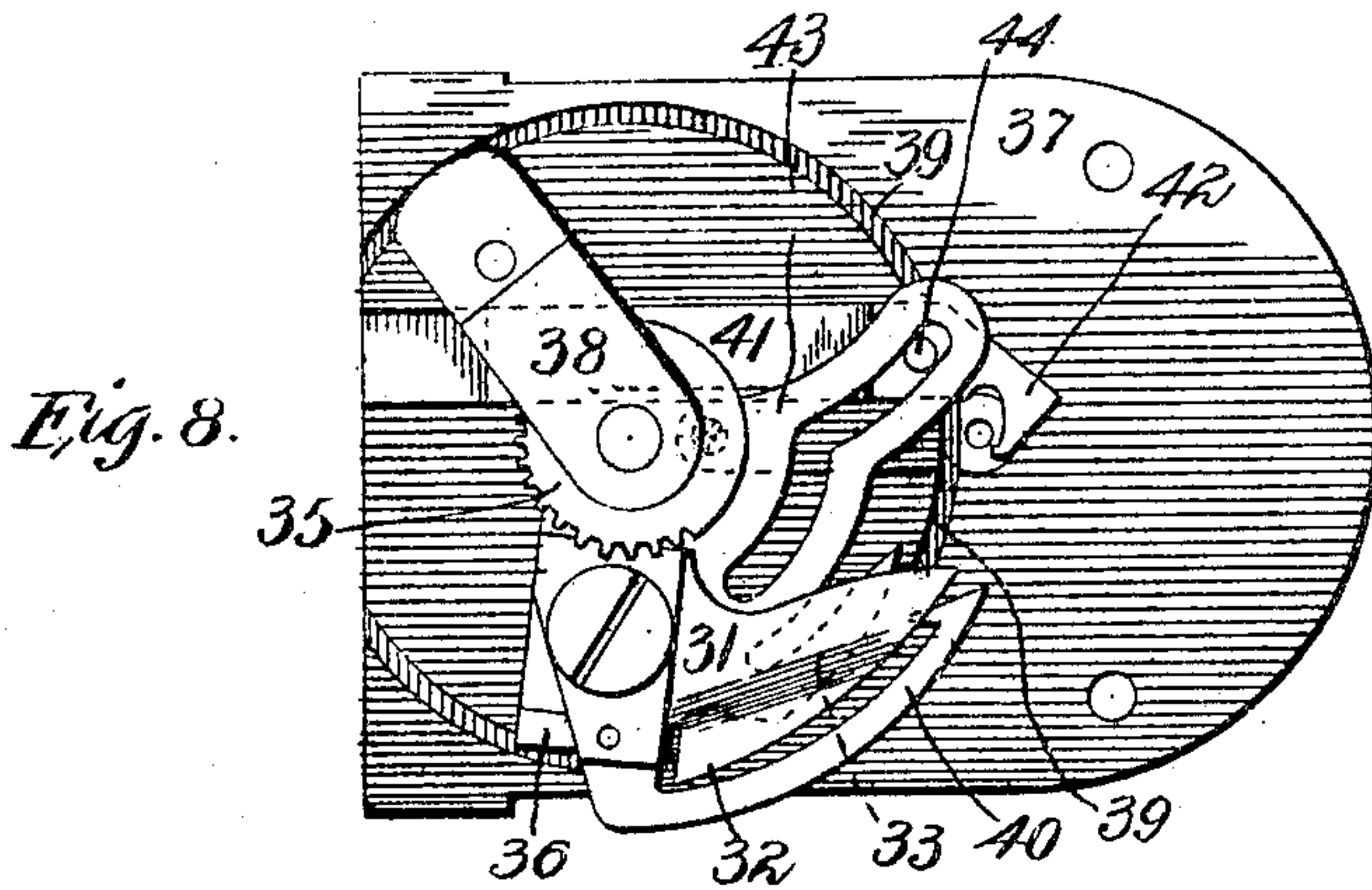
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G. S. GATCHELL.

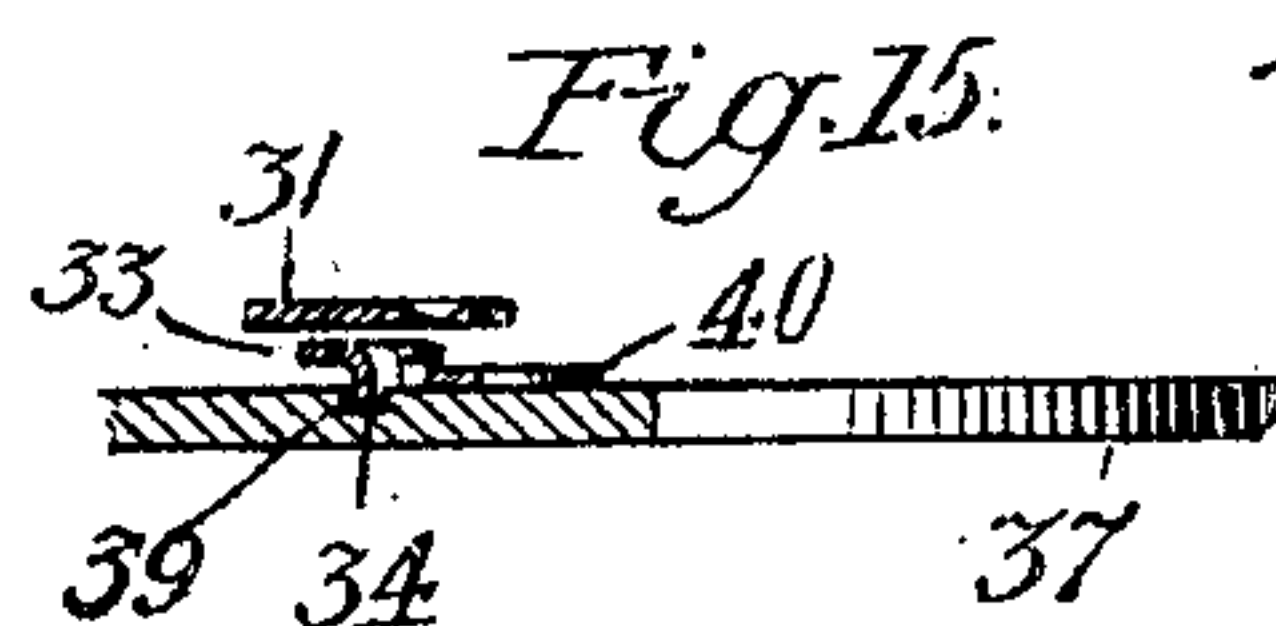
THREAD CUTTING AND HOLDING DEVICE FOR SEWING MACHINES.

APPLICATION FILED OCT. 1, 1904.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

GEORGE S. GATCHELL, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE
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THREAD CUTTING AND HOLDING DEVICE FOR SEWING-MACHINES.

No. 798,130.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed October 1, 1904. Serial No. 226,809.

To all whom it may concern:

Be it known that I, GEORGE S. GATCHELL, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Thread Cutting and Holding Devices for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

In the use of two-thread sewing-machines for forming groups of stitches and equipped with automatic thread-cutting devices for severing the threads at the completion of a stitching operation, as in barring, tacking, sewing on buttons, working buttonholes, &c., more or less difficulty has been encountered by reason of the fact that when the lower or shuttle thread has been severed at the completion of a stitching operation and the end of the thread running to the shuttle or lower-thread supply was left unconfined the first stitches of the next stitching operation would sometimes be imperfect, owing to a failure of the threads to become properly interlocked. This trouble has been due to the fact that when the severed end of the lower thread was left loose it would draw through one or more of the loops of the upper or needle thread at the commencement of the new stitching operation as the loops of the upper thread were tightened.

This invention has for its object to obviate the difficulty referred to by providing an automatic thread-holding device which will engage and nip the lower or shuttle thread between the lower-thread carrier or shuttle and the knife or blade for severing such lower thread before the cutting operation and in such a manner as to securely hold what would otherwise be the loose end of the thread, and thus the first stitch of a new group of stitches will be as perfectly formed as though the lower thread were anchored in the work.

In the accompanying drawings, Figure 1 is a side view of a button-sewing machine embodying the present invention. Fig. 2 is a bottom view of the same. Fig. 3 is a partial plan view, partly in horizontal section, of the same. Fig. 4 is a detail view of the double stop-motion tripping-cam device, and Fig. 5 is a detail view of the stop-motion cam. Figs. 6 and 7 are front and rear end views, respectively, of the machine. Figs. 8 and 9 are

bottom views of the throat-plate, showing in detail the thread-cutting and thread-nipping devices mounted thereon, the movable parts being in different positions in the two views. Fig. 10 is a view similar to Fig. 9, showing a slightly-modified form of the invention. Fig. 11 is an enlarged detail section on line *xx*, Fig. 9. Fig. 12 is a sectional view similar to Fig. 11, showing a slightly-modified form of the shuttle-thread-nipping device. Fig. 13 is a detail bottom perspective view of the knife which severs the needle-thread, and Fig. 14 a similar view of the knife which severs the shuttle-thread. Fig. 15 is a detail section on line 15 15, Fig. 10.

The button-sewing machine herein illustrated and to which the present invention is shown as being applied is of well-known construction and need not be herein described, excepting so far as may be necessary for an understanding of this invention. The needle 12 is carried by the needle-bar 13, operated from the main shaft 14, journaled in the upper part of the arm 15. Coöperating with the needle 12 is an oscillating shuttle 16, located beneath the work-plate 17 and operated from said main shaft in the usual manner, said shuttle carrying the lower or locking thread. This machine is equipped with a stop-motion device comprising a loose pulley 18 and a fast pulley 19, rigid with which latter is a stop-motion cam 20, said pulleys being mounted on the shaft 14. Coöperating with the fast and loose pulleys and pivotally mounted in a projection 21 of a bracket 22 is a start and stop motion lever 23, provided with a belt-shifter 24 and with a plunger 25, pressed upward by a suitable spring, the said stop-motion lever being pressed outward by a coil-spring 26. A detent-lever 27 normally holds the stop-motion lever in position so that the driving-belt will run on the fast pulley when the machine is in operation, the said detent-lever being tripped at suitable times when the machine is to be stopped by cams 28 on the cam-wheel 29, having a worm-gear connection (see Fig. 1) with the main shaft of the machine. The lever 23 is provided with a depending arm 30, which will be further referred to.

The present machine is provided with a thread-cutting mechanism for severing both threads beneath the work-plate of the ma-

chine and which is fully described in the application of Charles M. Horton, filed January 12, 1904, Serial No. 188,693. This thread-cutting mechanism comprises a blade or plate 31, having a cutting edge at 32, and a blade or plate 33, having an upwardly-projecting flange 34, at the forward end of which is a cutting edge 34^a. The blades or plates 31 and 33 are carried by an arm 36, rigid with a sector-gear 35, pivotally mounted on the throat-plate 37, and a bracket 38, secured to said throat-plate, the latter having in its lower face a curved groove 39 to receive the thread-cutting flange 34 of the plate 33. Movable with the cutting plates or knives 31 33 is a thread-nipping plate 40, which engages the needle-thread *n* when the needle rises after its first descent just subsequent to a thread-cutting operation and nips the same against the under side of the throat-plate, so as to securely hold the end of the severed thread running to the needle while the first two or three stitches of a new group are being formed, after which said thread end is released, as fully set forth in the said Horton application.

Heretofore no means have been provided in the machine herein shown to hold the end of the shuttle-thread when the same was automatically severed, and this want is now supplied by the present invention. To this end a sliding plate 41, movable in a suitable groove or way in the lower face of the throat-plate 37, is provided with a thread-nipping hook 42, which is inclined at its outer end, so as to pass by the lower or shuttle thread, but which hook is operated at the proper time to engage said thread before a thread-cutting operation and draw it inward, so as to nip and hold the thread between the point at which it is to be severed and the shuttle or other lower-thread supply. The slide or sliding plate 41, carrying the thread-nipping hook 42, is operated by a cam-plate actuated from the sector-gear 35, from which the thread-severing knives or plates are also actuated.

In the form of the invention shown in Figs. 8 and 9 the cam-plate 43 is integral with the blade 33 and swings with the sector-gear 35, said plate 43 being provided with a cam-slot engaging a pin 44 on the slide 41 to reciprocate said slide.

In the form of the invention shown in Fig. 10 the cam-plate 45 is an integral part of the slide 41^a, and its cam-slot is entered by a pin 46, carried by a tailpiece 47 of the arm 34, to which the thread-severing plates or knives 31 33 are attached.

In the form of the invention shown in Fig. 10 the hook 42^a is of thin spring metal and when in its thread-nipping or inner position, as shown, it yieldingly presses the shuttle-thread *s* against the under side of the throat-plate during the thread-severing operation

at the completion of a group of stitches and holds the severed end of shuttle-thread during the formation of one or more stitches of the new group of stitches next to be formed.

In the form of the invention shown in Figs. 8 and 9 the hook 42 is rigid and coöperates in nipping the shuttle-thread *s* with a small plate-spring 48, fixed to the throat-plate, and between which spring and said hook the said thread is held during the thread-nipping operation, as shown in Figs. 9 and 11.

In the slightly-modified form of the invention shown in Fig. 12 a plate-spring 49, attached to the throat-plate 37, is arranged to press the hook 42 yieldingly upward, so as to nip the shuttle-thread *s* between said hook and the lower surface of the said throat-plate.

The sector-gear 35, from which the thread-nipping hooks 42 in either form of the invention shown are operated, is in turn actuated by a rack 50, carried by a sliding bar 51, having near its rear end a notched plate 52, engaged by the lower end of a lever 53, actuated from the cam-groove 54 in the cam-wheel 29, said bar 51 also having at its rear end a pin 55, engaged by a fork of a bell-crank lever 56, which latter just as the machine is to be automatically stopped is coupled to the depending arm 30 of the stop-motion lever 23, so that the final or thread-severing forward movements of the knives, approximately to the dotted-line position shown in Fig. 9, will be effected by the overthrow of the said stop-motion lever, all as fully set forth in the specification of the Horton application hereinbefore referred to, the thread-nipping hook 42 being next projected to its forward position (shown in Fig. 8) in readiness to engage the shuttle-thread when the knives are in their extreme backward positions and the said hook being retracted to nip the shuttle-thread when the said knives make their initial forward movements to the positions shown in Fig. 9 prior to the thread-cutting operation. During the time when the thread-severing operations occur the thread-nipping hook 42 remains stationary, owing to the concentric or idle part of the cam-slot in either form of the invention shown, entered by the pin by which said hook is operated, and the said thread-nipping hook is not moved forward to release the shuttle-thread until after the initial stitch of a new group of stitches has been formed, and preferably not until two or three stitches of the new group of stitches have been tightened into the work.

From the foregoing it will be apparent that the present invention provides an efficient means for automatically holding the severed end of the lower or shuttle thread of a two-thread sewing-machine when the same has been automatically severed at the completion of a group of stitches, said severed thread being retained by the nipping device until

after the formation of the initial stitch of a new group of stitches.

The invention is not to be understood as being limited to the particular embodiments thereof or to the particular operating mechanism herein shown and described, as these may be varied widely without departing from the essence of the invention.

Having thus described my invention, I claim
10 and desire to secure by Letters Patent—

1. In a two-thread sewing-machine, the combination with upper and lower stitch-forming devices, of a movable thread-cutter for the lower thread, and means, comprising a movable member separate from said thread-cutter, for nipping the lower thread before a thread-cutting operation and holding it until after the formation of the initial stitch succeeding each thread-cutting operation:

20 2. In a two-thread sewing-machine, the combination with upper and lower stitch-forming devices and a movable thread-cutter, located beneath the work-plate, for severing the lower thread, of a device, comprising a movable nipping member separate from said thread-cutter, for holding the end of the said lower thread when severed, and operating means for causing the said thread-holding device to engage and nip the said lower thread before the same
25 is severed and hold it until after the formation of the initial stitch succeeding such thread-cutting device.

3. In a two-thread sewing-machine, the combination with upper and lower stitch-forming devices and a stop-motion device which permits of the formation of groups of a predetermined number of stitches, of a cutting device for the lower thread, and a moving thread-nipping device separate from said thread-cutter and which is adapted to engage said lower
35 thread and hold the end of the same, when severed, until after the formation of the initial

stitch of a new group succeeding the thread-severing operation.

4. In a two-thread sewing-machine, the combination with upper and lower stitch-forming devices, of means, comprising a moving knife or cutter, for severing both threads beneath the work, a moving thread-nipping device for the lower thread timed to engage and nip said thread before it is severed and to hold it until after the formation of the initial stitch succeeding the thread-severing operation.

5. In a two-thread sewing-machine, the combination with upper and lower stitch-forming devices, of means for severing both threads beneath the work, a moving thread-nipping device for the lower thread timed to engage and nip said thread before it is severed and to hold it until after the formation of the initial stitch succeeding the thread-severing operation, and a moving thread-nipping device timed to engage the upper thread subsequent to a thread-severing operation and hold the said upper thread until after the formation of the first stitch of a new group of stitches.

6. In a two-thread sewing-machine, the combination with upper and lower stitch-forming devices, of thread-cutting knives movable beneath the throat-plate of the machine, and a moving thread-nipping device for the lower thread receiving its movement from the part which actuates said knives and in such manner as to cause said thread-nipping device to engage said lower thread prior to a cutting operation and hold it until after the formation of the first stitch succeeding such cutting operation.

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

GEORGE S. GATCHELL.

Witnesses:

HENRY J. MILLER,

HENRY A. KORNE MANN.