

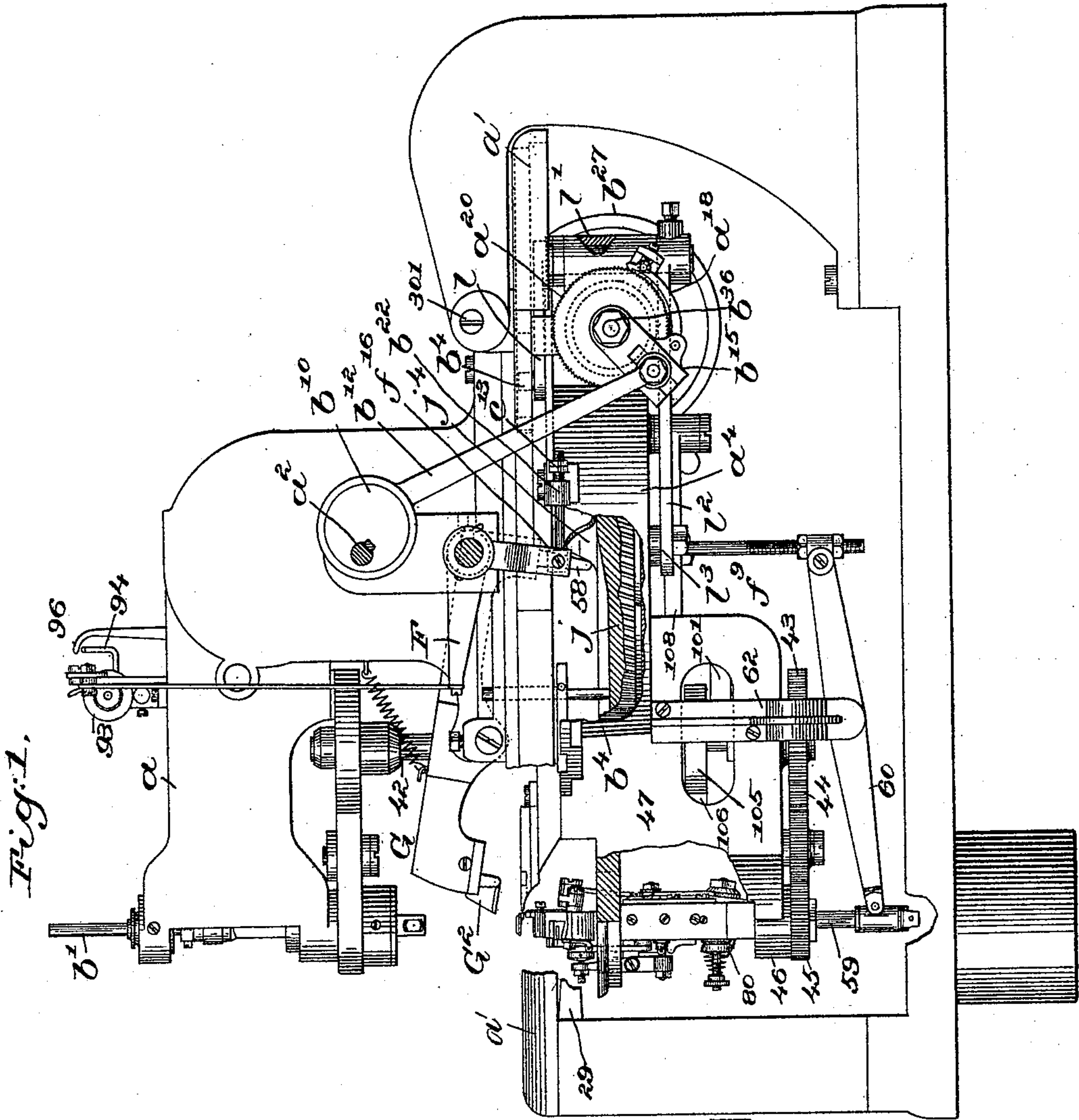
(No Model.)

5 Sheets—Sheet 1.

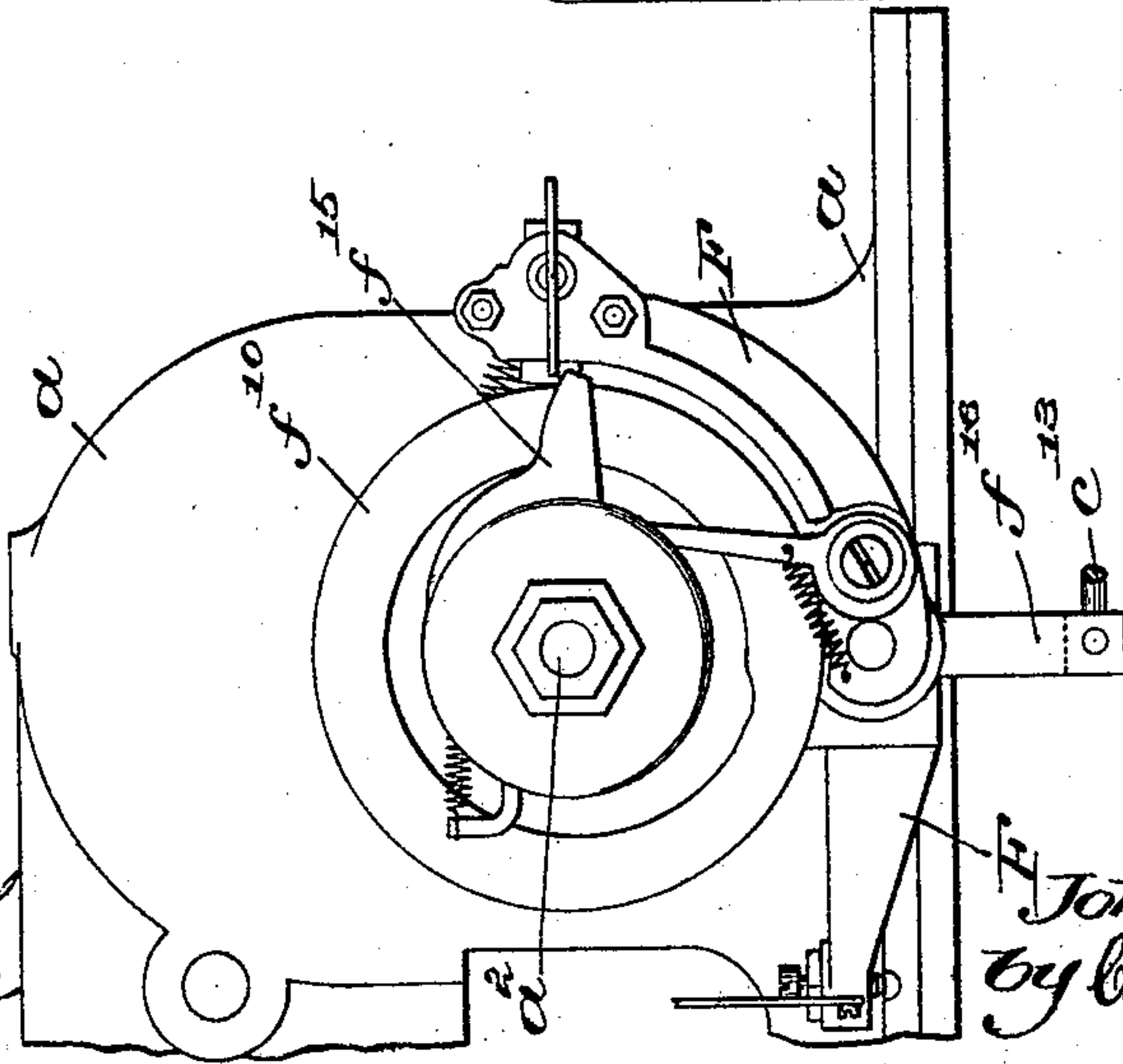
J. REECE.  
SEWING MACHINE.

No. 498,216.

Patented May 23, 1893.



*Fig. 11.*



Witnesses.

Fred S. Gammell  
Louis N. Howell

Inventor.

John Reece  
by Crosby Gregory

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SEWING MACHINE.

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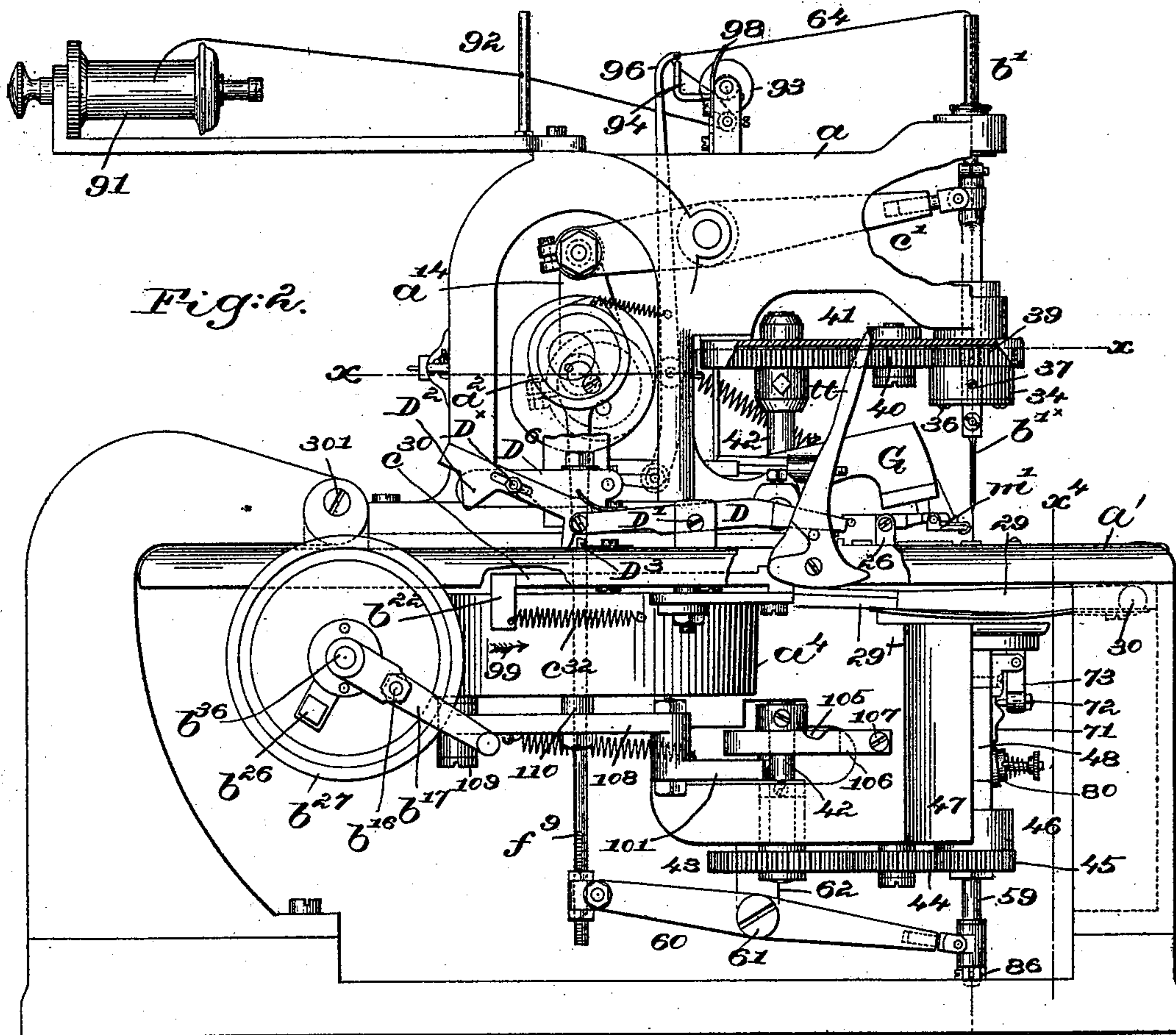


Fig. 2.

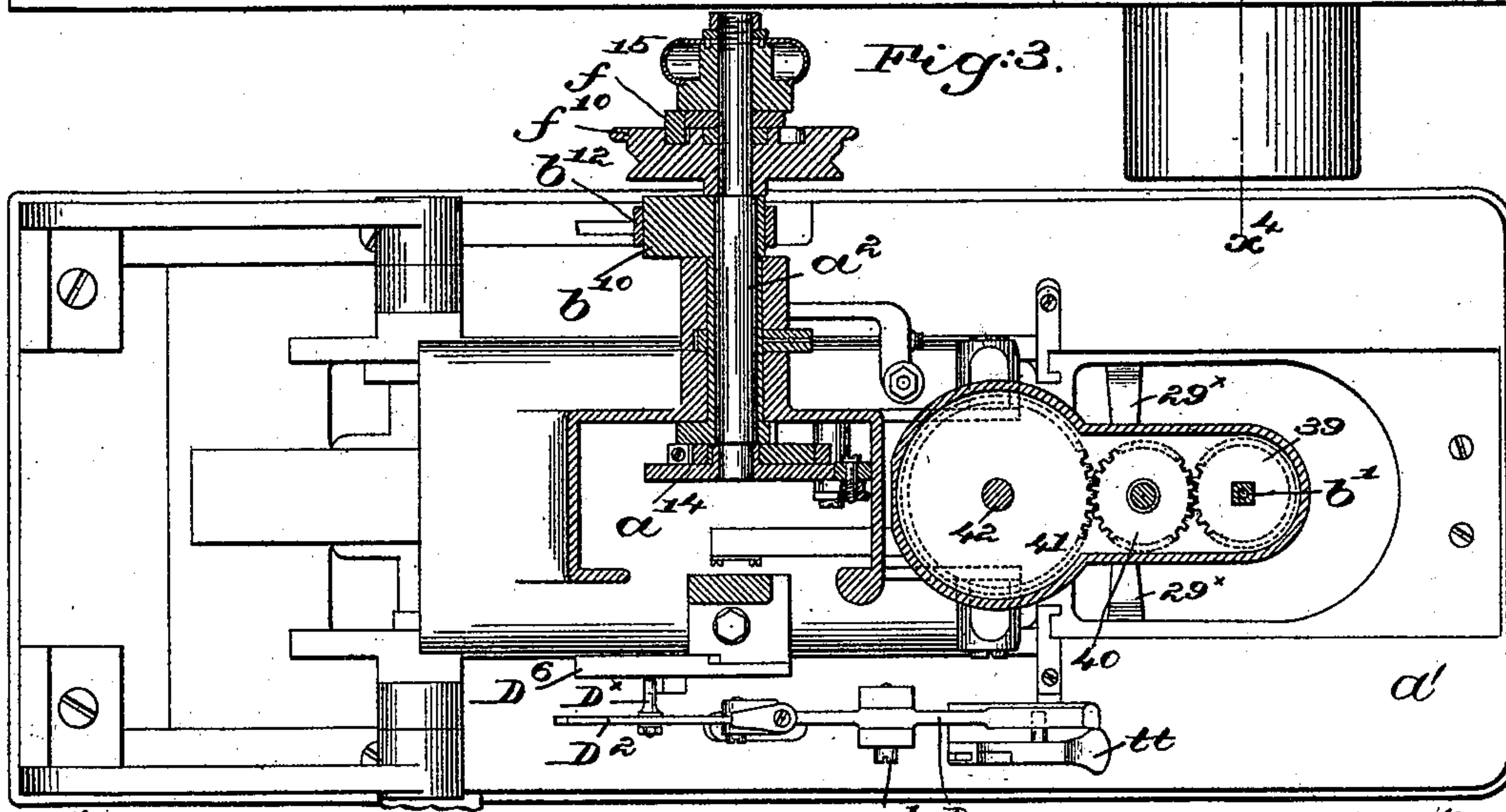


Fig. 3.

Witnesses.

Fred S. Grunleaf  
Louis W. Couell

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John Reece  
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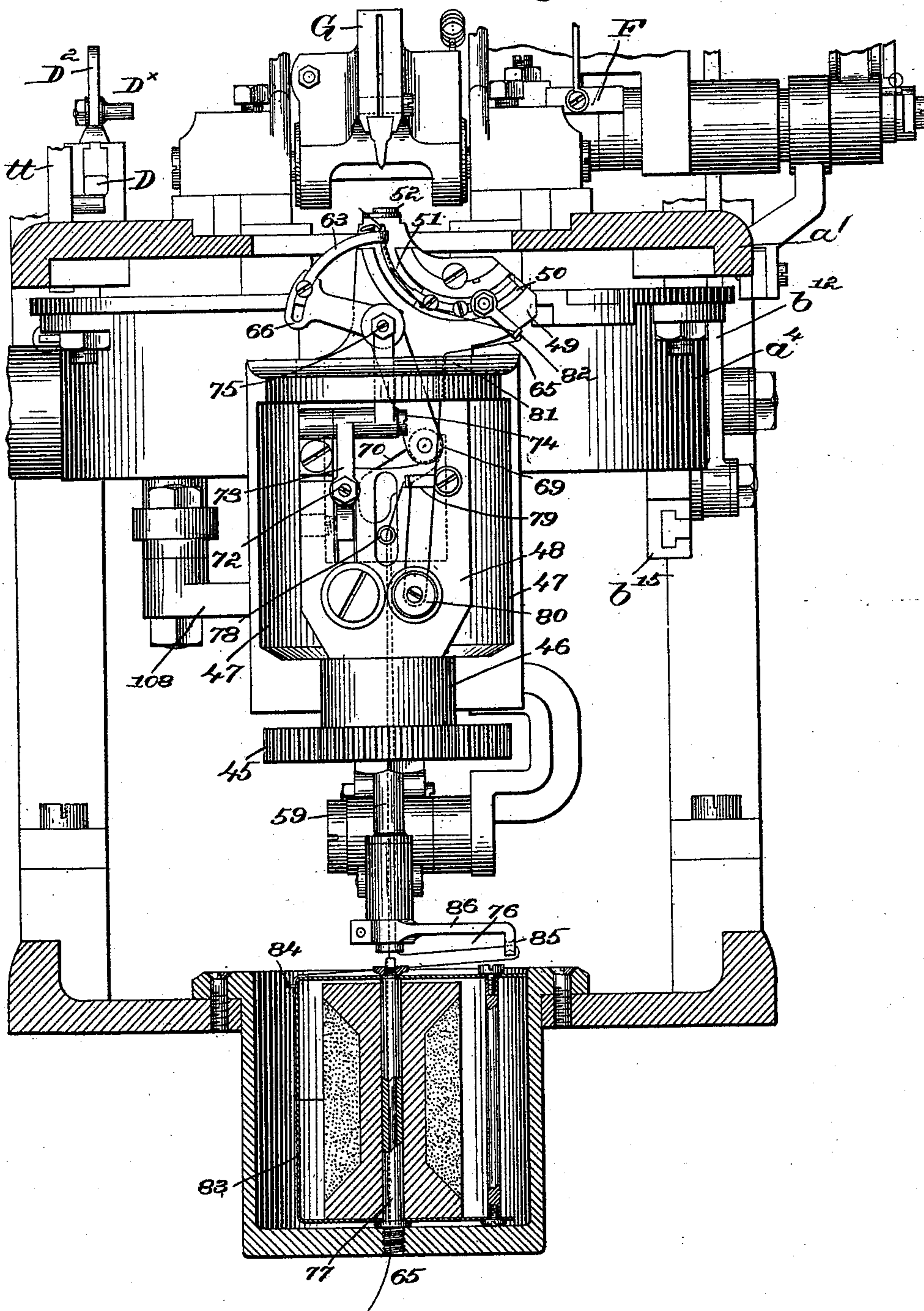


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Fig. 4.



Witnesses.

Fred S. Guileaf  
Louis W. Goull

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(No Model.)

J. REECE.  
SEWING MACHINE.

5 Sheets—Sheet 4.

No. 498,216.

Patented May 23, 1893.

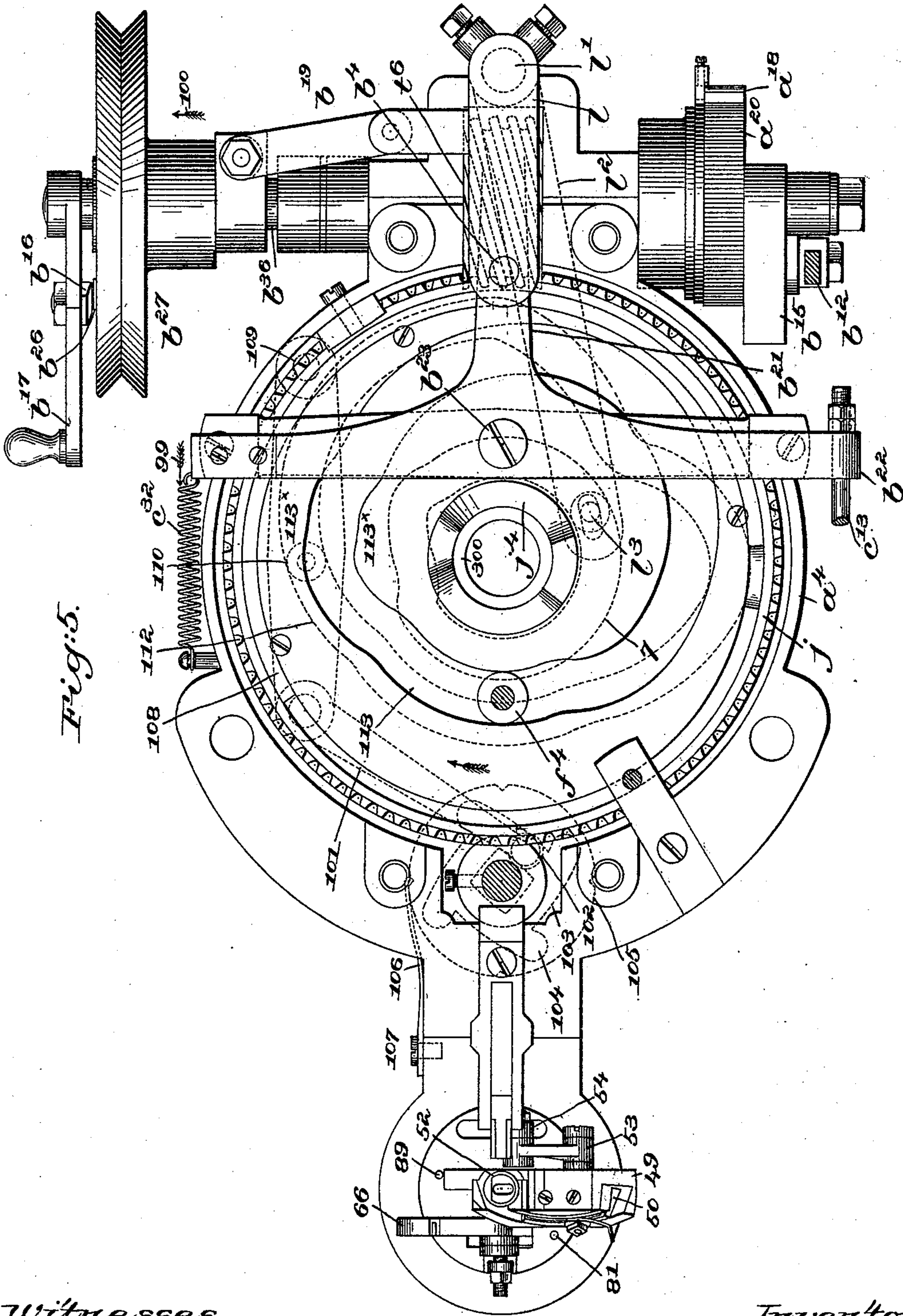


Fig. 5.

Witnesses.  
Fred S. Grunke,  
Louis W. Couell

Inventor:  
John Reece,  
by Crosby & Gregory, attys

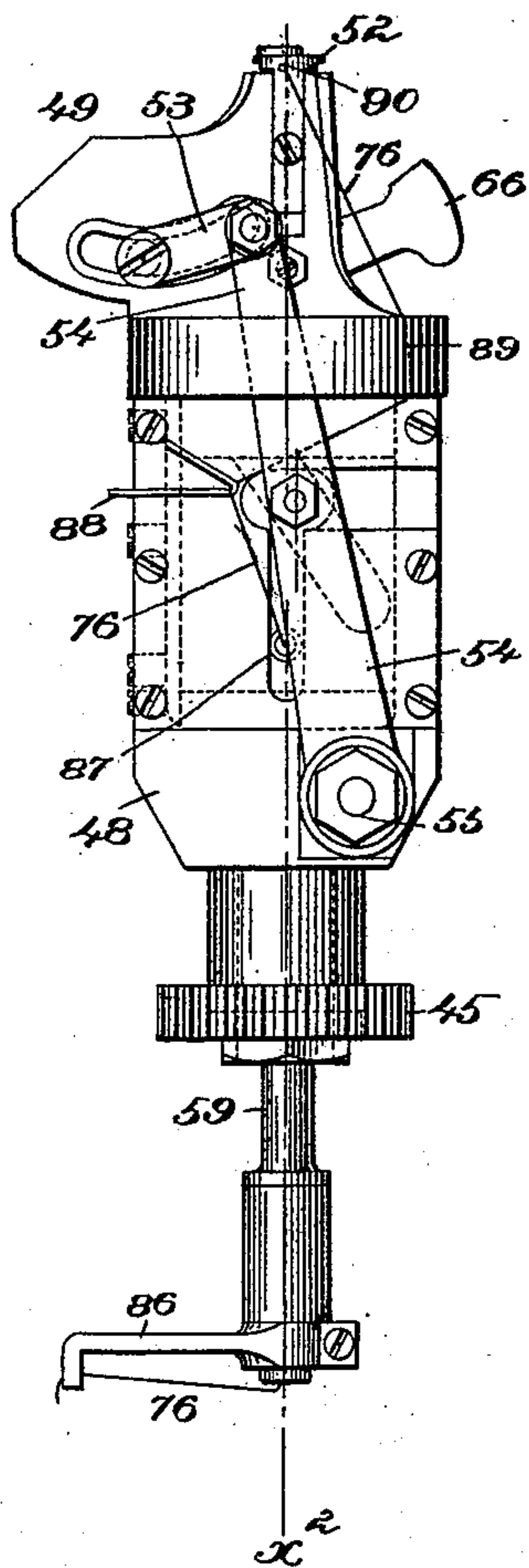


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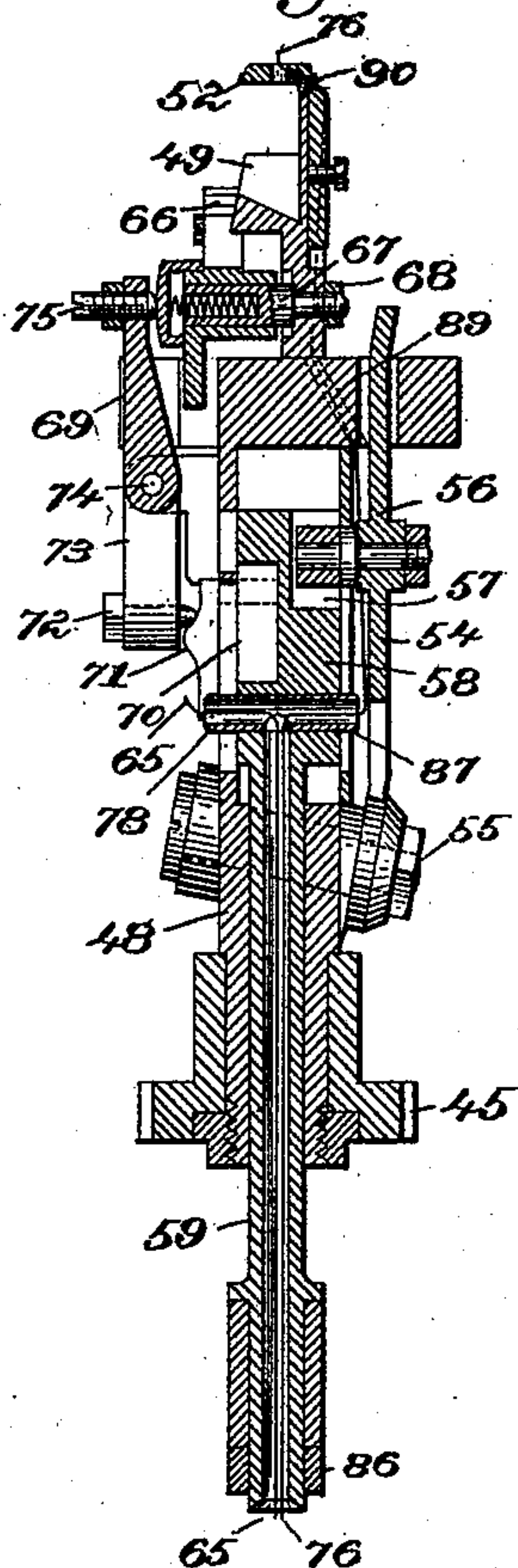
No. 498,216.

Patented May 23, 1893.

*Fig: 6.*



*Fig: 7.*



*Fig:8.*

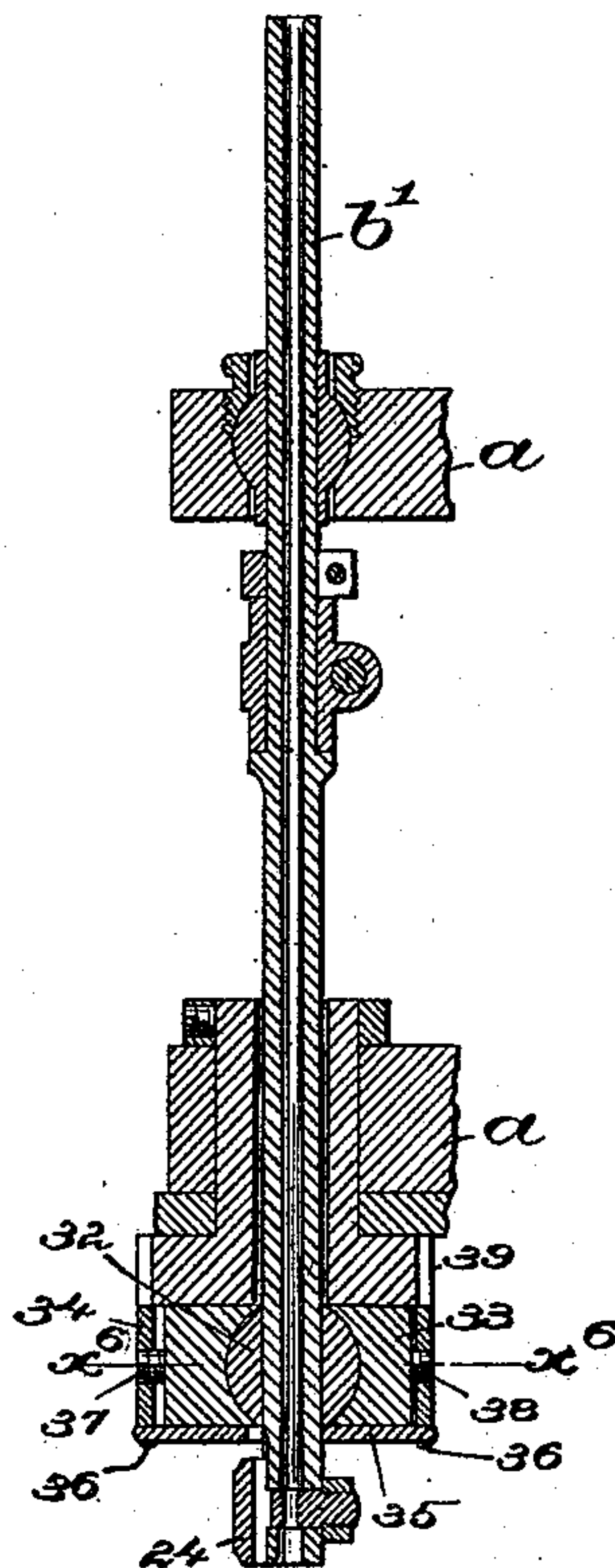


Fig: 9

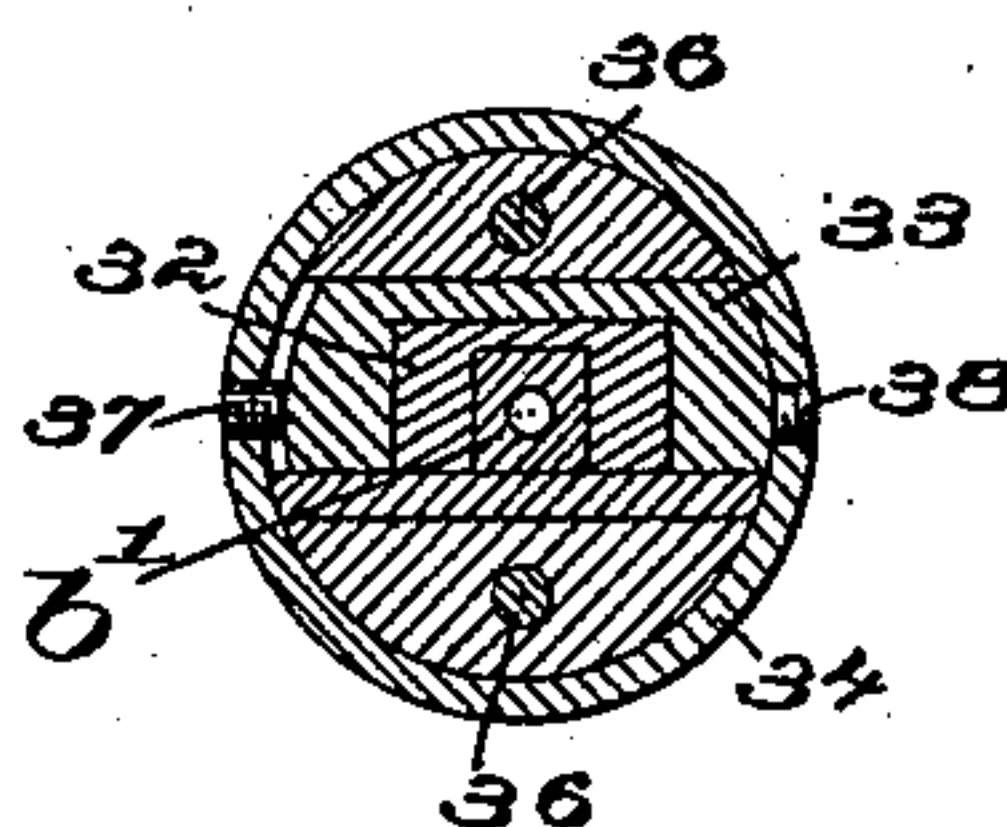
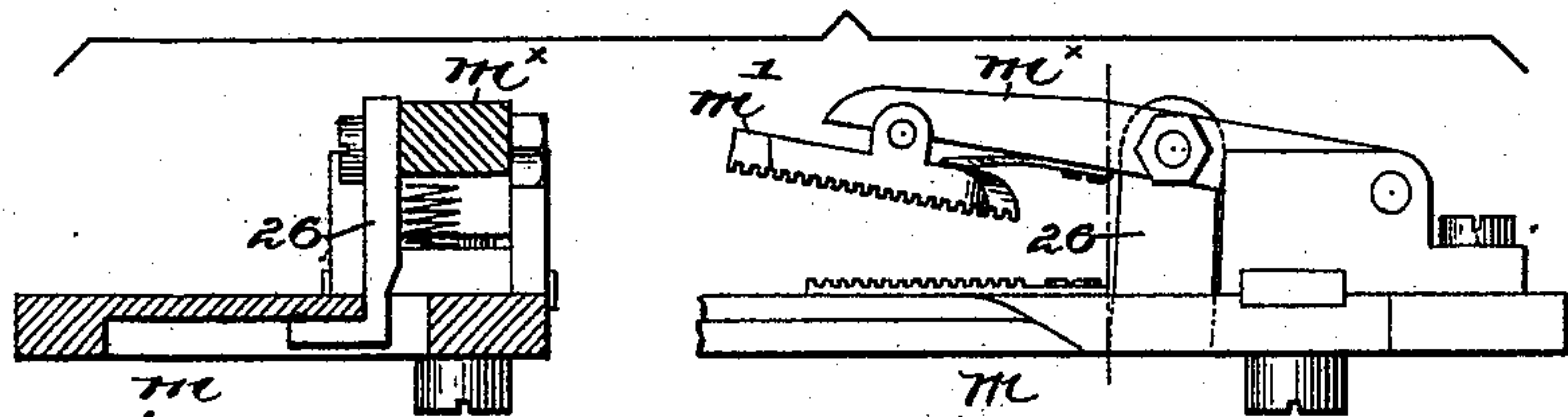


Fig: 10.



Witnesses.

Fried. L. Grunkeaf.  
Louis W. Jewell

*Inventor*

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# UNITED STATES PATENT OFFICE.

JOHN REECE, OF BOSTON, MASSACHUSETTS.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 498,216, dated May 23, 1893.

Application filed November 2, 1892. Serial No. 450,742. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN REECE, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

Earlier machines devised by me and made subject of United States Letters Patent have comprised a stitch-frame containing stitch-forming mechanism, and a clamp-frame containing a work-clamp, and said parts have had combined with them suitable devices to not only actuate the stitch-forming mechanism for stitching, but also for relatively changing the positions of the stitch-frame and clamp-frame to insure the production of over-edge stitches along the sides and ends of a button-hole slit, and some of said earlier machines have contained instrumentalities whereby the small end of the button-hole has been barred by stitches of greater length but at right angles to the length of the button-hole slit.

In some kinds of work manufacturers like a button-hole showing both ends rounded, and in this my present invention I have devised means whereby with stitch-forming mechanism much like that shown in my former patents I am enabled to completely rotate the stitch-forming devices instead of as in said patents rotate said devices partially in one and then in a reverse direction. By simply imparting to the stitch-forming mechanism a full rotation, a part while stitching one, and a part while stitching the other end of the button-hole, the depth-stitches at and about the ends of the button-hole will lie in a curve, and this I may do, but as a further advance I have so constructed my improved machine that while the small end of the button-hole is being stitched, the parts instrumental in changing the relative positions of the stitch-frame and clamp-frame operate so that the outer line of the depth stitches at the small end of the button-hole will lie in a line substantially at right angles to the length of the button-hole slit, and this same result may if desired be produced at both ends of the button hole by

slight change in shape of the cams controlling this relative movement.

In the machine herein to be described, when used for button-hole work, the rotation of the stitch-forming mechanism is suspended while the straight sides of the button-hole are being over stitched, but when used for over stitching eyelet holes, the relative change of position of the stitch-frame and clamp-frame will be entirely suspended and only the rotary motion retained during the stitching operation, the relative change of position of said parts being however used to bring the work-clamp into and out of operative relation to the cutting mechanism which is made automatic.

The machine herein to be described is automatic in all its movements after the operator closes the work-clamp, that is, the material is cut, the stitching is started, and at the completion of the hole of whatever form, the stitching is automatically stopped.

The machine herein to be described and of my invention is I believe, the first devised containing a needle-bar provided with an eye-pointed needle located above the work-clamp, and having complementary stitch-forming devices located below the said work-clamp, the said stitch-forming devices both below and above the work-clamp being adapted to be fully rotated in one direction, the movement of rotation being always in the same direction, said stitch-forming mechanism being adapted for making over-edge stitches.

Figure 1 is a right-hand side elevation, partially broken out, of a machine embodying my invention, the parts being in the condition for clamping the work; Fig. 2, a left-hand side elevation also partially broken out; Fig. 3, a section below the line  $x$ , Fig. 2; Fig. 4, an enlarged view partially in section from the front of the machine, the parts shown being in the line  $x^1$ , Fig. 2; Fig. 5, an enlarged plan view of the parts below the clamp-frame, the under-thread carrier and looper being omitted. Fig. 6 is a rear side view of the complementary stitch-forming mechanism shown in Fig. 5, the same being however removed from its bearings. Fig. 7 is a section on the line  $x^2$  Fig. 6; Fig. 8, a longitudinal section of the needle-bar and some of its surrounding



parts; Fig. 9, a section in the line  $x^6$ , Fig. 8; Fig. 10, a detail of one of the upper clamp members and its attached leg; Fig. 11, a detail of the three-armed lever F and clutch pulley and dog.

The machine to be herein described, in many of its parts is substantially the same as that shown in United States Patent No. 494,280, dated March 28, 1893, so that many of said parts need herein be but briefly described.

Referring to the drawings,  $a$  represents the upper part of the stitch-frame, the same being connected to a curb or base portion  $a^4$  having at its center an upwardly extended hollow hub 300, see Fig. 5, which serves as a bearing for a cam device marked  $j$ , which differs however slightly in the shape of its cam grooves, as will be described hereinafter, from the like-designated cam device in the patent referred to, the said cam device carrying a cam  $j^4$  which in practice operates upon a toe 58 of a cutter lever G having a cutter  $G^2$ . The cam device has its periphery provided with a series of worm teeth, thus constituting at the edge of the cam device a worm gear, which latter is engaged and rotated by a worm  $t^6$  see dotted lines Fig. 5, on an actuating shaft  $b^{36}$ , said actuating shaft being provided at one end with a normally loose pulley  $b^{27}$  which is rotated continuously, said pulley carrying one-half  $b^{26}$  of a suitable clutch, the other half being a projection  $b^{16}$  on a crank or arm as  $b^{17}$  fast upon the said actuating shaft  $b^{36}$ . The shaft  $b^{36}$ , at its opposite end, is provided with a ratchet wheel  $a^{20}$  which is moved intermittently by a suitable pawl  $a^{18}$  connected with a pawl-carrier  $b^{15}$  deriving its motion of reciprocation from a suitable link  $b^{12}$ , said link in practice deriving its motion from a suitable eccentric  $b^{10}$ , fast upon the shaft  $a^2$  upon which in practice is mounted loosely the main belt wheel,  $f^{10}$ , see Fig. 3, said belt wheel being designated in the said patent by like letter. Herein the belt wheel will be coupled and uncoupled from the shaft  $a^2$  exactly as provided for in the said patent, the controlling devices for the belt wheel having been herein omitted because fully shown and described in that patent.

The constantly moving pulley  $b^{27}$  when coupled to the shaft  $b^{36}$  rotates the worm and the worm wheel referred to continuously, it being desired at such times to have the machine operate at its maximum speed, as when the relative change of position of the parts are being effected to bring the work held by the cloth clamp into operative position with relation to the cutting mechanism, said cutting mechanism, as herein represented, being the same in all its parts as in the patent referred to. This pulley  $b^{27}$  is put into and out of clutch at the proper time by or through an extension  $b^{21}$  of a three-armed lever  $b^{22}$  pivoted at  $b^{23}$ , said lever being connected by a link  $b^{19}$  with a block having a hub about which the said pulley rotates. The lever  $b^{22}$  has connected

to it at one end a spring  $c^{32}$ , and the other end of the lever is provided with a hole to receive a link  $c^{13}$  connected in practice to one arm  $f^{16}$  of a three-armed lever or device F, see Fig. 11, which controls the clutch dog  $f^{15}$  co-operating with the main belt pulley  $f^{10}$ , as provided for in said patent, to automatically stop the stitching action of the stitch-forming mechanism.

The clamp frame  $a'$  is located between the parts  $a$  and  $a^4$  of the stitch-frame, said clamp frame in this instance of my invention being anchored at 301, so that in the relative movements of the stitch-forming mechanism with relation to the clamp frame and work clamp, the clamp frame and clamp remain stationary, while the stitch-forming mechanism travels in the direction of the length of the button-hole, and in this present invention the cam device has been provided at its under side with a cam groove 7 see dotted lines Fig. 5, to receive a roller or other stud  $l^3$  of a lever  $l^2$  fast upon a vertical shaft  $l'$  having an arm  $l$  provided with a suitable upright pin or stud  $b^4$ , on which is loosely mounted a block which enters a longitudinal groove at the rear end of the clamp-frame, such groove and devices as provided for in the said patent, giving the stitch forming mechanism a suitable movement to carry the stitching about the enlarged or eye-end of the button-hole, but it will be obvious that should it be desired to make that end of the button-hole without an enlarged eye, the employment of the groove 7 would be unnecessary, or if used, it would be a perfect circle. It will be understood that if the stitch frame should be anchored or held and the main shaft started, the clamp frame would then be the movable member, and under such conditions the stitching mechanism and other parts would be moved and would co-operate in the cutting and stitching of a button-hole in just the same manner only the stitching mechanism would not travel longitudinally. The shaft  $b^{36}$  and its attached worm will be rotated intermittently during the stitching operation, the machine then running at its slowest speed, and the change from continuous to intermittent motion of the shaft  $b^{36}$  will herein be effected as provided for and in the time and order described in the said patent.

The shaft  $a^2$  will in practice be provided with a suitable compound eccentric to actuate a link  $a^{14}$  jointed to the rear end of a needle-bar actuating lever  $c'$  joined in suitable manner to a needle-bar  $b'$  in order to reciprocate the same, the said needle-bar at its upper end having a ball-bearing, see Fig. 8, all in usual manner, but the shape of the lower part of the needle-bar and its bearing have been altered as I will describe later.

The clamp-frame  $a'$  has mounted upon it, as provided for in the said patent, a work-clamp, composed of upper and lower members, said work clamp consisting essentially of plates  $m$ , upon which are erected blocks to receive levers  $m^x$  having feet  $m'$ , said le-



vers having depending notched legs 26, see Fig. 10, which are engaged by spring arms 29<sup>x</sup> carried by arms 29 of a rock-shaft 30 under the control of a clamping lever marked *t*, 5 *t*, said clamping lever, when turned over to the left viewing Fig. 2, moving the arms 29 in a direction to effect the closing of the work-clamp upon the work, such movement of the lever resulting in releasing the slide-bar *c*<sup>30</sup>, 10 so that the lever *b*<sup>22</sup> may be turned by spring *b*<sup>32</sup> and effect the coupling of the continuously rotating pulley *b*<sup>27</sup> with the shaft *b*<sup>36</sup>, the movement of shaft *b*<sup>36</sup> at high speed continuing until the button-hole has been cut and 15 the material put into stitching position, when, as provided for in the said patent, the continuously rotating clutch is disconnected from the said actuating shaft and the ratchet wheel *a*<sup>20</sup> is made to assume control of and rotate 20 the actuating shaft intermittently during the stitching operation.

United States Patent No. 349,359 shows a lever substantially like the lever *t*, *t*, but herein the shape of the lever is slightly 25 changed to co-operate with the precise slide-bar which controls the lever *b*<sup>22</sup>.

The parts hereinbefore referred to and designated by letter, with the exceptions stated as to the grooves in the cam device *j*<sup>4</sup> and the 30 shape of the needle-bar, are substantially as in the Patent No. 494,280, referred to, and herein they will be actuated as in the said application.

I will now more particularly describe the 35 apparatus to be added to the form of machine represented in Patent No. 494,280 in order to effect the novel operations included within the scope of this invention. That portion of the needle-bar *b'* below its connection with 40 the lever for reciprocating it is square or made of some other shape than round, and is fitted to slide in a circular bearing 32 as shown in Figs. 8 and 9, said bearing being mounted in a longitudinally movable block 33 contained 45 within the casing 34 by a plate 35 attached to the casing by screws 36. The casing has two like screws 37, 38, see Figs. 1 and 8, which by being turned in opposite directions enable the block carrying the circular bearing 50 to be moved longitudinally in the casing in order to locate the needle bar more or less at one side of the center of rotation of the casing in order that the depth stitch may be of greater or less length. The eye- 55 pointed needle *b'*<sup>x</sup> may be connected with the lower end of the needle-bar in any usual or suitable manner. The casing 34 has a gear 39 which is engaged by an intermediate gear 40, actuated by a gear 41 of twice its diameter fast upon a shaft 42 having suitable bearings in the stitch-frame to keep it in vertical position. This shaft 42 at its lower end has attached to it, see Figs. 1 and 2, a toothed gear 43 of the same diameter as the toothed 60 gear 41, the gear 43 engaging an intermediate gear 44, the said intermediate gear in turn engaging a gear 45, the hub of which enters

a bearing 46 in an extension 47 of the casing 70 *b*<sup>4</sup>, said gear and hub being fixed on or with relation to the block 48 carrying the complementary stitch-forming mechanism and its actuating devices to be described. The block 48 has at its upper end a suitable race-way 49 for the segment 50 carrying the under 75 thread carrying needle 51. The race-way 49 has adjustably mounted upon it a needle throat 52 having a slot through which passes the under thread carrier and also down through which passes the eye-pointed needle carrying the upper thread. The segmental 80 block 50 referred to derives its motion from a link 53 jointed to the upper end of a lever 54 having its fulcrum at 55 on the block 48, said lever, see Fig. 6 having a suitable roller or other stud 56 which enters a cam groove 85 57 in a cam block 58 attached to a vertically reciprocating rod 59 suitably jointed after the manner of the needle bar with a lever 60 pivoted at 61 upon a hanger 62 depending from the casing *b*<sup>4</sup>, said lever deriving its move- 90 ment from a vertically reciprocating rod *f*<sup>9</sup>, which rod in this present instance of my invention is just the same as and operated in like-manner and by like devices as provided for in my said patent No. 494,280. Co-oper- 95 ating with the under-thread-carrier is a looper 63 which takes the loop of upper-needle thread 64, holds and spreads the same below the throat 52 in order that the under-thread-carrier 51 with its thread 65 may pass up 100 through the loop of upper-needle thread held by the looper, the loop of the under thread carrier being in turn entered above the material by the needle *b'*<sup>x</sup> in its next descent.

The stitch frame *a'* is the same as in United 105 States Patent No. 349,359; but herein the devices for actuating the looper are entirely different, as for instance, the looper is carried by an elbow-shaped lever 66 the hub of which is mounted upon a stud screw 67, see Fig. 7, 110 fastened to a portion of the block by a suitable nut 68, the said stud screw being bored out centrally to receive a spring, the outer end of which acts against the interior of the hub of the looper-carrying lever 66, so that 115 the said looper carrying lever in addition to its movement about the said stud as a center, may also slide on the said stud in order that the looper may be moved to one side to let it, when moved in its backward direction, pass 120 without striking and deflecting the under thread carrier.

The lower end of the looper-carrying lever is provided with a roller or other stud 69 which enters a cam groove 70 made, in this 125 instance, in the same slide block containing the groove for moving the lever 54. The slide block 58 referred to has also a cam projection 71 which, in the reciprocations of the slide block, acts upon an adjustable projection 72 130 carried by a lever 73 mounted upon a stud screw 74, said lever at its upper end having preferably an adjustable screw or projection 75 to act against the end of the hub of the



looper-carrying-lever to thus push upon the said hub in opposition to the said spring when the looper-carrying lever is to slide longitudinally on the said stud in the production of the stitch. The bar 59 rotates, it will be understood, with the block 48 and is hollow, as best represented in Fig. 7.

I experienced very considerable difficulty in devising devices for properly delivering the under-thread 65 and the usual cord thread 76, but solved that problem by mounting the cord-thread or stay-cord spool on a hollow journal 77 so that the under-thread 65 might be led through the journal about which the stay cord spool rotated, and thence through the hollow bar 59 and out through a hole 78 therein, as shown in Figs. 4 and 6, thence through a guide-eye 79 and down about a suitable tension device 80, thence up through a hole 81 in the block through a guide-eye 82 carried by the needle segment, and thence through a second hole in said needle segment and into the eye of the under-thread-carrier. The stay cord 76 is led off, see Fig. 4, through an eye in a flier-like frame 83, thence through a suitable tension device 84 and through an eye 85 in an arm 86 extended from and rotating with the rod 59, the stay-cord being led from the said eye also through the hollow rod 59 and out through the eye 87, see Figs. 6 and 7, thence up through a guide 88 across behind the lever 54 and up through a hole 89 in the block and thence through a hole 90 in the side of the throat and up to the material through the same slot in the throat in which the needle and under thread carrier work. As the rod 59 is rotated, the arm 86 acting on the stay cord, rotates the flier and spool with it, both of which turn freely about the hollow spindle 77, and as the machine is operated to effect the relative change of position of the stitch-forming devices, including the throat, with relation to the clamp-frame, the strain upon the stay-cord is sufficient to rotate the spool in the flier to give off the required amount of stay cord. The upper needle thread will in practice be taken from a suitable spool or bobbin 91 and led thence through a thread guide 92, see Fig. 2, around a suitable tension device 93 through a guide-eye 94, thence through an eye in the end of the take-up lever 96, and then into a hole made longitudinally through the needle bar from its upper to its lower end, the tubular construction of needle-bar being shown in Fig. 8, the needle thread after passing out through the lower end of the needle bar being threaded through the usual eye of the eye-pointed needle. The upper thread take-up may be of any usual or suitable construction, the take-up herein shown being substantially the same as that illustrated in my said patent No. 494,280.

In operation, the parts being in the position Figs. 1 and 2, with the clamp open and the cutter elevated, the operator will turn the lever  $t$ ,  $t$ , to the left, and in so doing will, through the arms 29 and their attached spring

fingers, 29<sup>x</sup>, see Fig. 3, close the clamp, and the lever  $t$ ,  $t$  in its movement as described will release the slide bar  $c^{30}$ , so that the lever  $b^{22}$  will be moved in the direction of the arrow 99, shown in Figs. 2 and 5, by the spring  $c^{32}$ , and will through the link  $b^{19}$  push the continuously running pulley  $b^{27}$  in the direction of the arrow 100, see Fig. 5, to effect the engagement of the clutch parts  $b^{26}$  and  $b^{16}$ , to thus rotate the shaft  $b^{36}$  rapidly and continuously, thus rotating rapidly the cam device  $j$  until the cam projection  $j^4$  thereon strikes and depresses the cutter  $G^2$  to cut the material, the rapid movement of the cam device being continued until the relative change of position referred to has been sufficient to bring the small end of the button-hole in correct position under the stitch forming mechanism, at which instant the continuously rotating clutch pulley  $b^{27}$  is slid in the opposite direction on or with relation to the shaft  $b^{36}$  by or through the devices for controlling the clutch co-operating with the main belt-pulley  $f^{10}$ , the said main belt-pulley at that time being clutched upon the shaft  $a^2$ , thus starting in motion the connecting rod  $b^{12}$ , and, through the pawl  $a^{18}$  described, imparting intermittent rotation to the said shaft and cam device  $j$  at a slower speed, such slow speed prevailing through the stitching operation. The shaft 42 having the large gears 41 and 43 at its upper and lower ends, is rotated intermittently by or through a pawl 101 having a projection 102 shown by dotted lines Fig. 5, said projection entering a groove 103 having suitable pockets, 104, said groove and pockets being in a plate 105 fast on the said shaft, there being, in this instance, four such pockets which are engaged one after the other by the said pawl so as to give to the said shaft a quarter turn, the shaft being locked or held frictionally in the position where it is left by the pawl by or through a suitable locking device shown in Fig. 5 as a spring 106 held in place by a set screw 107. The pawl is pivotally attached to one end of a lever 107 having its fulcrum at 109, said lever having a roll 110 which enters a cam groove 112 see dotted lines Fig. 5 at the under-side of the cam device  $j$ . The upper side of the cam device  $j$  has a single cam groove 113 represented by full lines except where it passes under the lever  $b^{22}$ , Fig. 5, said groove receiving a roller or other stud  $f^4$  connected to the clamp-frame, said stud being common to the Patent No. 494,280 referred to. In this present instance of my invention the stud  $f^4$  connected with the clamp frame and running in the groove 113 at the upper side of the cam device results,—the clamp-frame being held stationary,—in moving the stitch-frame so that it first slides from the small end of the button-hole along one side thereof to the commencement of the eyelet end, when the stitch frame, including the throat in this instance, is moved laterally as in Patent No. 494,280 referred to, to carry the stitch-forming devices in the path of the eye of the button-hole,



and at the same time the stitch-forming mechanism has imparted to it a half-turn, such movement of the stitch-forming mechanism ending about as the eye is completed, after which the stitch frame is again moved with its throat toward the center line of the button-hole, and thence along the second straight side thereof, until the small end of the button hole has been reached, when the longitudinal movement in that direction ceases and the rotation of the stitch-forming mechanism in the same direction as before is again taken up, but during this second semi-rotation of the stitch-forming mechanism, the cam groove 113 in the upper side of the cam device is of such shape at 113<sup>x</sup> as to slightly reverse the movement of the stitch frame, so that for the first half of the second semi-rotation of the stitch forming mechanism, the stitch frame is moved slightly toward the eyelet end of the button-hole, and during the remainder of the said semi-rotation the stitch frame is again moved in a direction away from the eyelet end of the button-hole, the stitching being stopped at the completion of the second semi-rotation of the stitch-forming mechanism, but the movement of the cam device is continued but at the highest speed of the actuating shaft, the intermitting motion being at that time thrown out and the continuous motion substituted for it until the stitch-forming mechanism and the cutting mechanism occupy their normal or starting positions with the cutting mechanism elevated, and the clamp opened, as represented in Fig. 1 of the drawings. As a result of the semi-circular movement of the stitch-forming mechanism and the two short reciprocations of the stitch frame at the same time, the small end of the button-hole is finished and left with its depth stitches in a straight line substantially at right angles to the length of the button-hole, rather than in a curved line as would be the result if the two short reciprocations of the stitch frame described were omitted.

This invention is not limited to the particular path for the under thread and the stay thread after they leave the openings 78 and 87.

In Fig. 2 I have shown a lever D pivoted at D' and jointed at one end to a trigger D<sup>2</sup> having an adjustable stud D<sup>x</sup> which in practice rides on an incline on a lever D<sup>6</sup> pivoted at one end to the stitch frame, said trigger having a toe which co-operates with a trigger rest D<sup>3</sup> to aid in holding the lever *t*, *t*, in position and releasing it when desired. These parts are all found in my patent No. 349,359 where, in most instances, the same designating letters are employed.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A sewing machine containing the following instrumentalities, viz;—a clamp frame; a work clamp mounted thereon; a stitch frame; stitch forming mechanism including a needle-bar located wholly above the clamp frame and

provided with an eye-pointed needle, and complementary stitch forming mechanism located below said clamp frame, and devices to actuate the said stitch forming mechanism for the production of over-edge stitches and to rotate the said stitch forming mechanism in one direction rotation after rotation, substantially as described.

2. A sewing machine containing the following instrumentalities, viz;—a clamp frame; a work clamp; a stitch frame; stitch forming mechanism including a needle-bar located wholly above the clamp frame and provided with an eye-pointed needle, and complementary stitch forming mechanism located below said clamp frame; devices to actuate the said stitch forming mechanism for the production of stitches and to rotate the said stitch forming mechanism in one direction rotation after rotation, and devices to change relatively the positions of the stitch frame and clamp frame to insure the production of overedge stitches along the sides and about the end of a button-hole, substantially as described.

3. A sewing machine containing the following instrumentalities, viz;—a clamp frame; a work clamp; a stitch frame; stitch forming mechanism including a needle-bar located wholly above the clamp frame and provided with an eye-pointed needle, and complementary stitch forming mechanism located below said clamp frame, devices to actuate the said stitch forming mechanism for the production of stitches and to rotate the said stitch forming mechanism in one direction rotation after rotation, devices to change relatively the positions of the stitch frame and clamp frame to insure the production of overedge stitches along the sides and about the end of a button-hole, and a button-hole cutter and means to operate the same intermittingly, substantially as described.

4. The casing 34, the block 33 therein and its contained spherical bearing, combined with the needle-bar adapted to be reciprocated in said bearing, and devices to adjust said block in said casing to determine the length of the depth stitch, substantially as described.

5. The casing, the hollow needle-bar therein provided with an eye-pointed needle, and the hollow rod or bar 59, the block 58, the under thread thread-carrier, its actuating devices and gears 39 and 45, combined with the intermittingly rotating vertical shaft 42 and gearing actuated thereby to positively rotate said gears 39 and 45 in unison and with them the stitch forming mechanism, substantially as described.

6. The frame provided with a race-way, a needle segment and connected eye-pointed thread-carrier; a hollow rod 59 contained and vertically movable in said frame and provided with slotted slide plate, and the throat plate also movable with the said frame, combined with the arm 86; a flier through which the stay cord is led, and a hollow stud forming the center of rotation of the flier and about



which the cord rotates, the under thread being led through said hollow stud and the wound mass of stay cord on its way into and through the hollow rod 59, the combination being and  
5 operating, substantially as described.

7. In a sewing machine, the following instrumentalities, viz;—a clamp frame; a work clamp; a stitch frame; stitch forming mechanism therein; devices to rotate the stitch  
10 forming devices in the same direction a semi rotation at each end of the button-hole, and devices to change the relative positions of the stitch frame and clamp frame to insure not only the production of overedge stitches along

the sides and outer end of the button-hole, 15 but also to impart a slight movement to and fro in the direction of the length of the button-hole while the stitch forming mechanism is being given a semi rotation at the end of the button-hole for the purpose set forth. 20

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

JOHN REECE.

Witnesses:

G. W. GREGORY,  
EMMA J. BENNETT.