

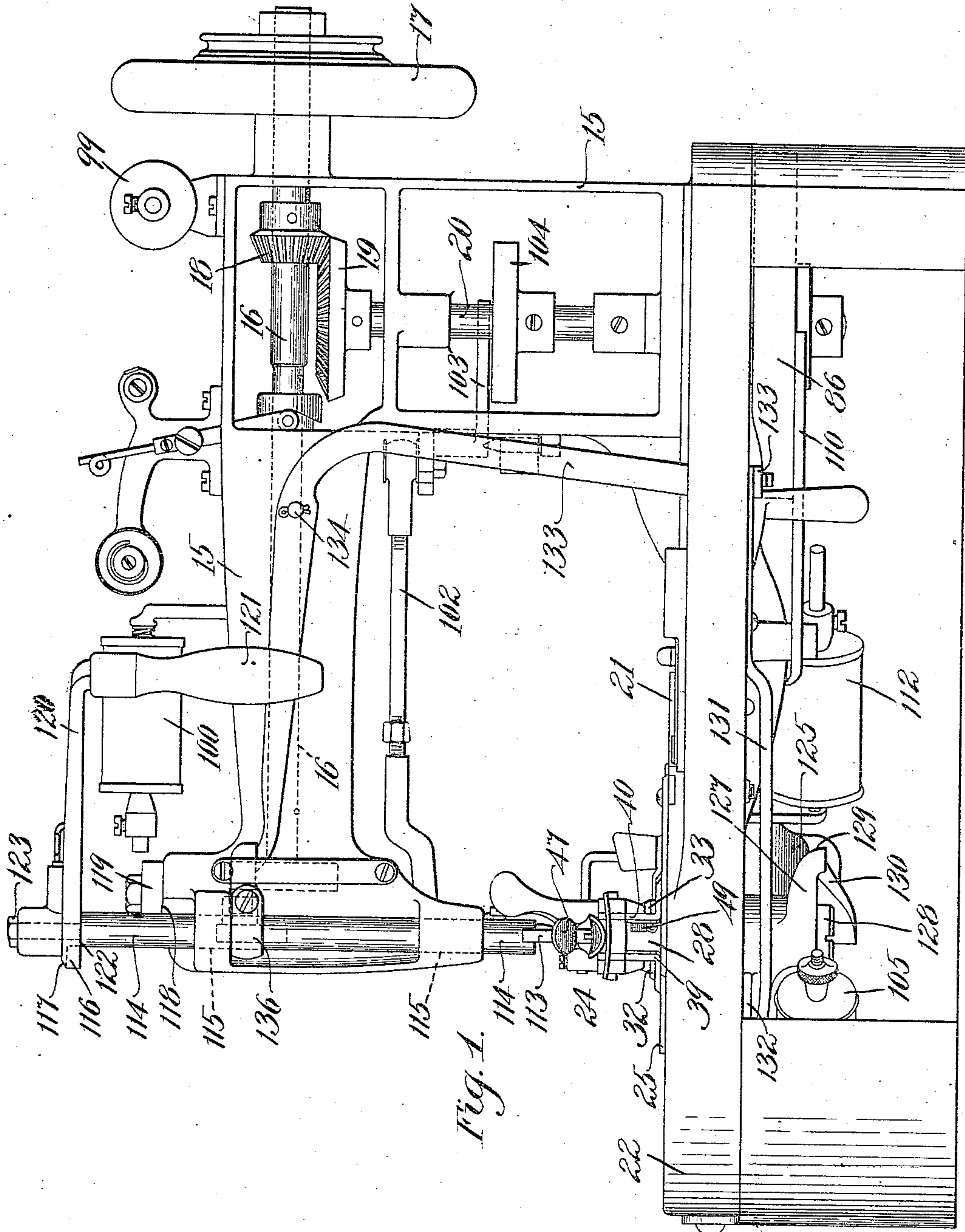
No. 855,186.

PATENTED MAY 28, 1907.

J. KIEWICZ.
BUTTONHOLE SEWING MACHINE.

APPLICATION FILED FEB. 19, 1906.

5 SHEETS—SHEET 1.



Witnesses:
Percy F. Wolfe,
Franklin E. Low.

Inventor:
John Kiewicz,
by his attorney, Paul S. Gooding.

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5 SHEETS—SHEET 2.

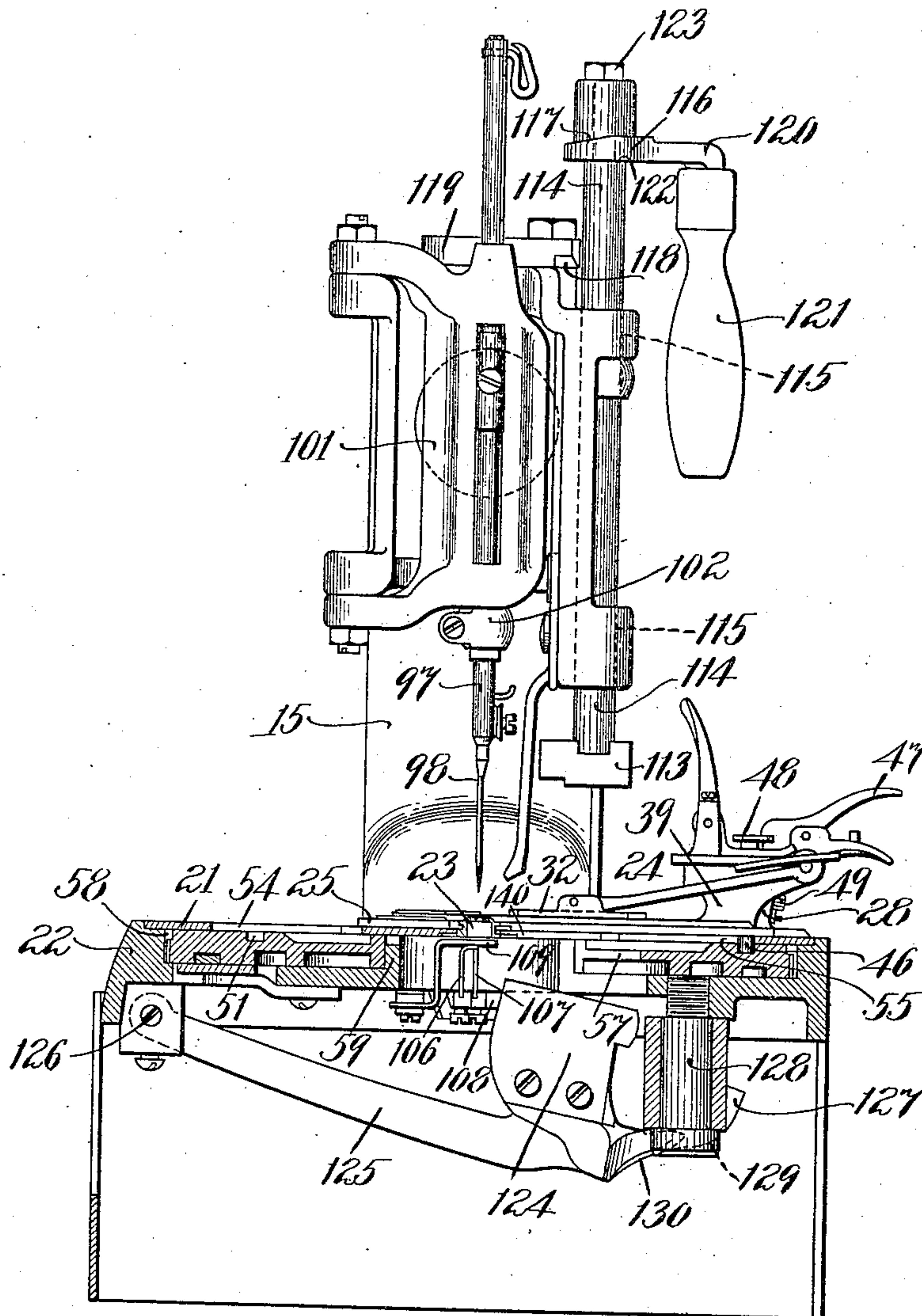


Fig. 2.

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5 SHEETS—SHEET 3.

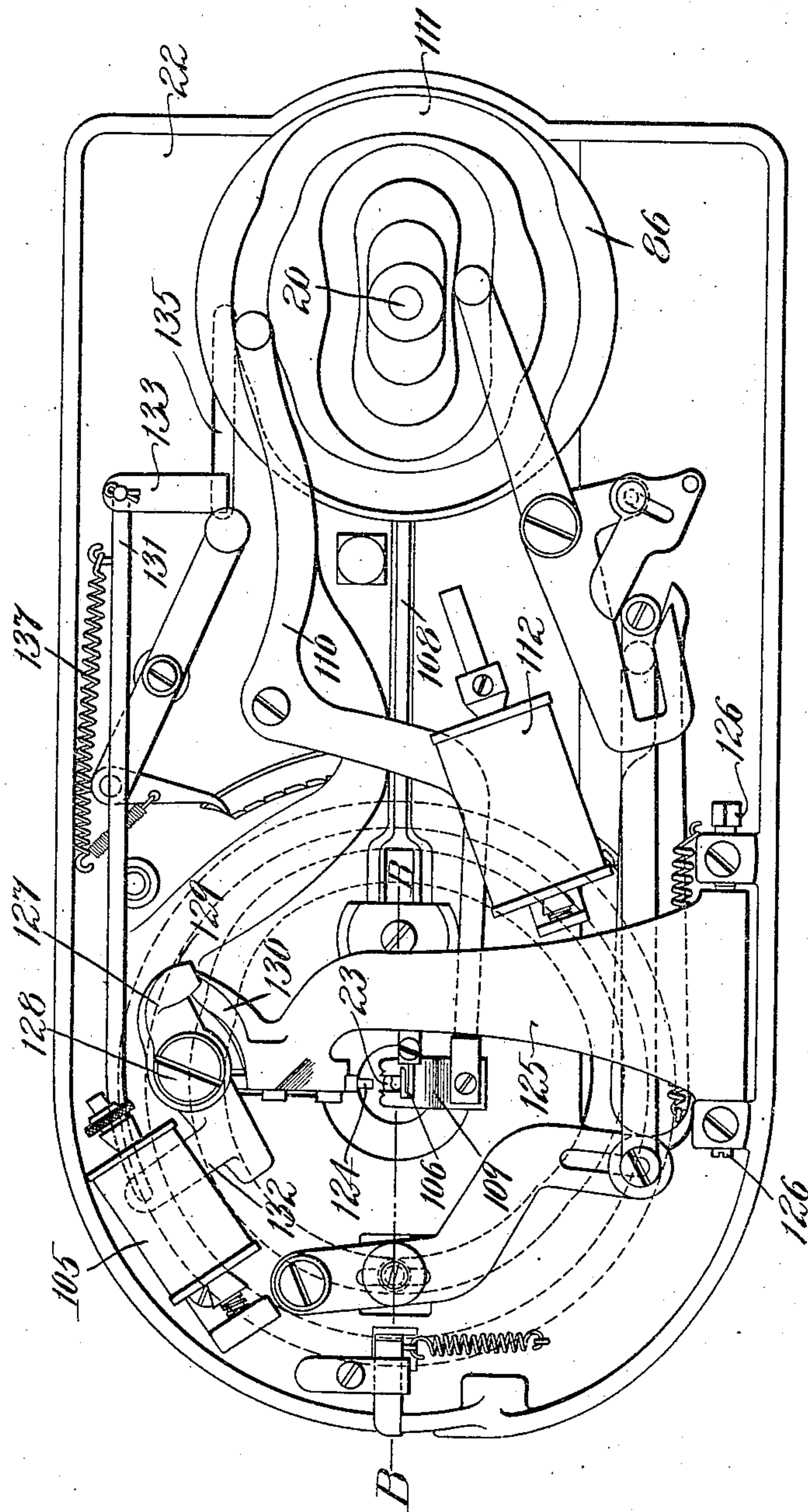


Fig. 3.

Witnesses:
Percy F. Wolfe.
Franklin E. Low.

Inventor:
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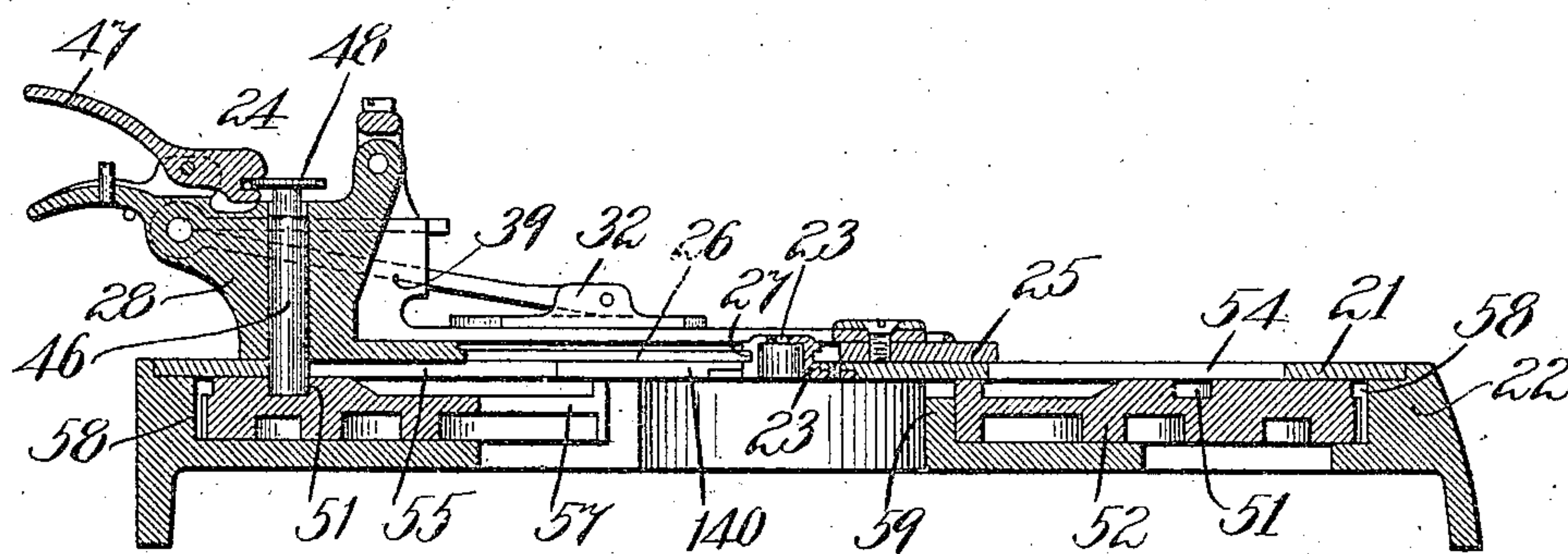
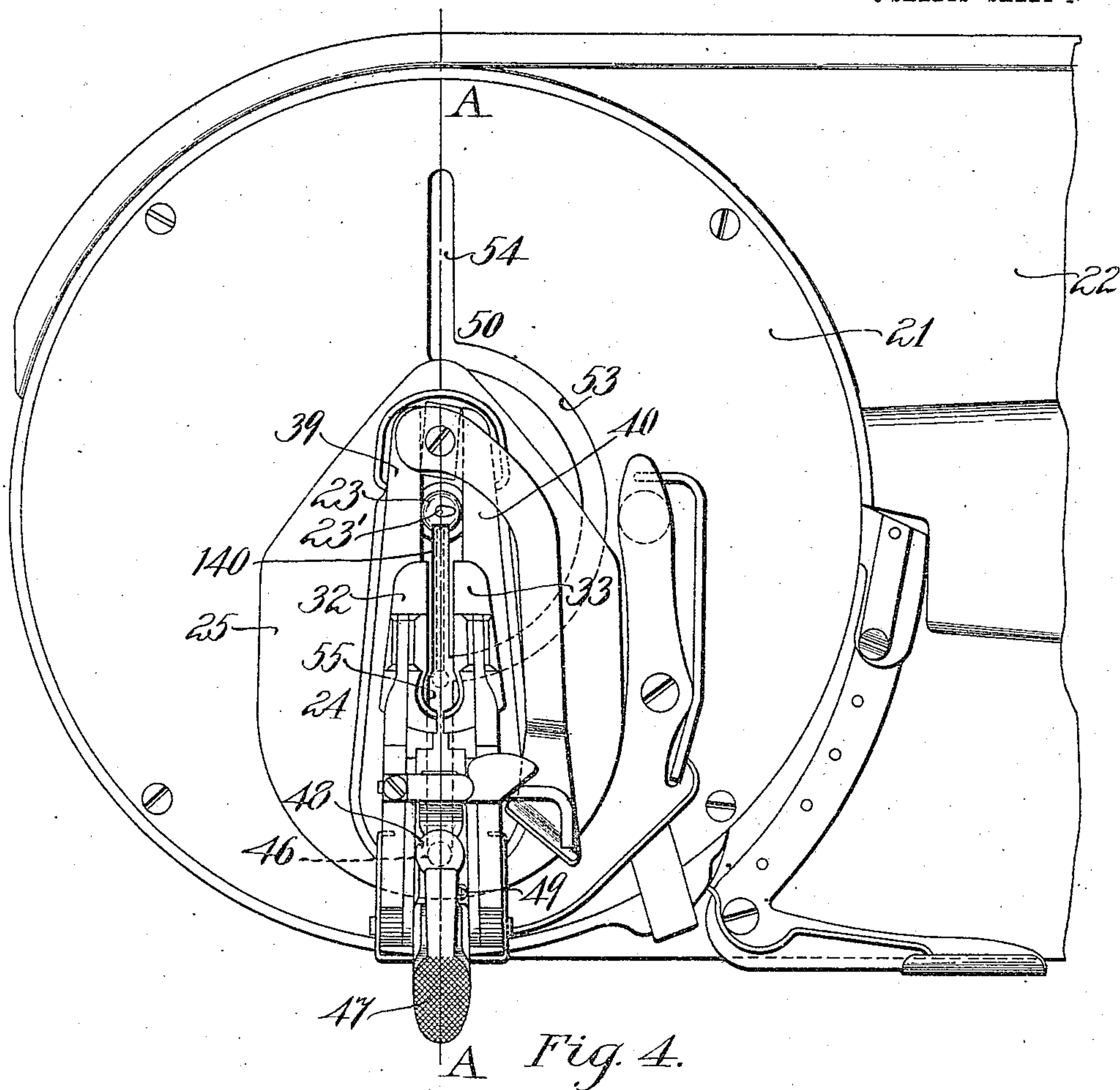
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Witnesses:

Percy F. Wolfe.

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5 SHEETS—SHEET 6.

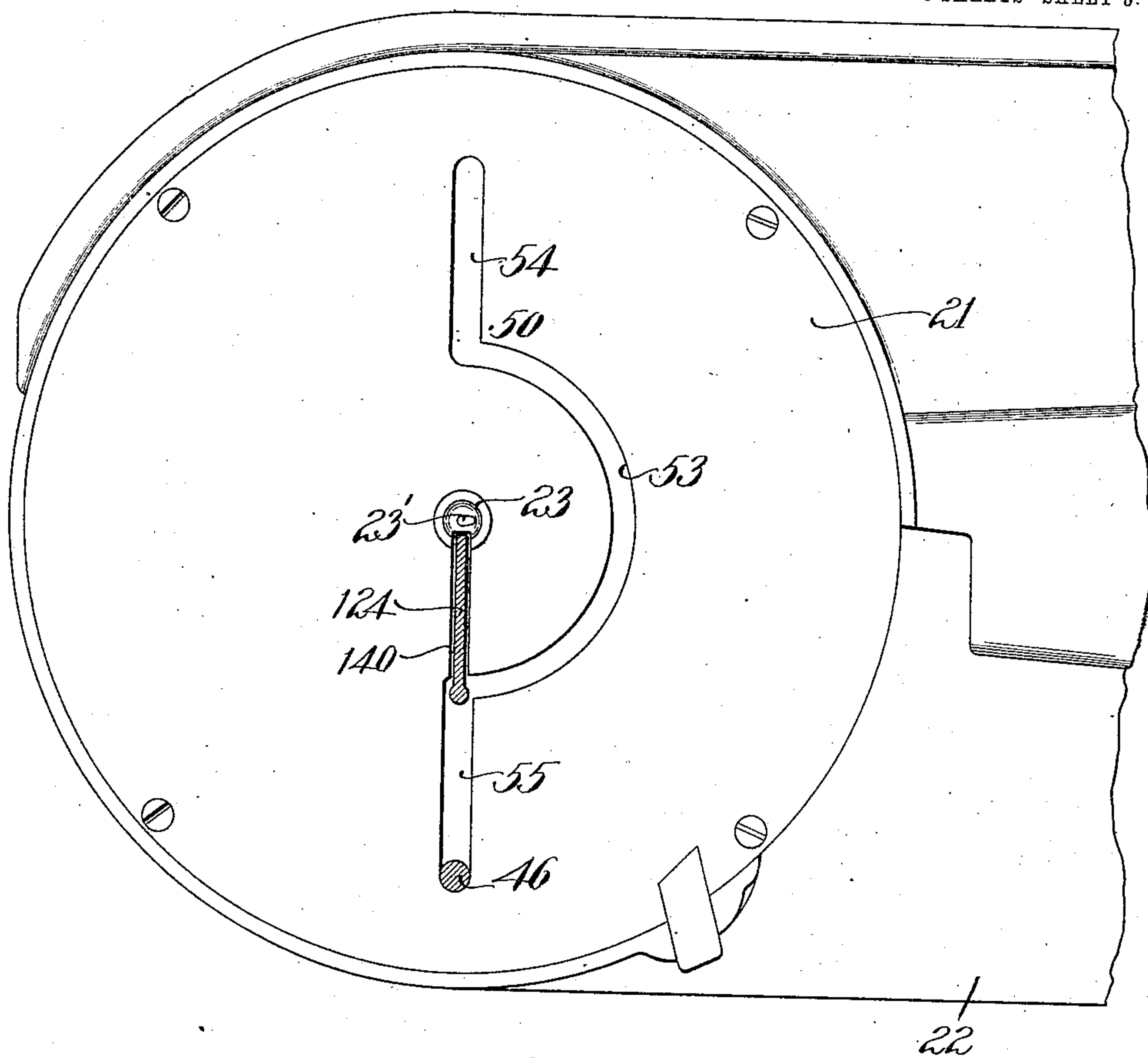


Fig. 5.

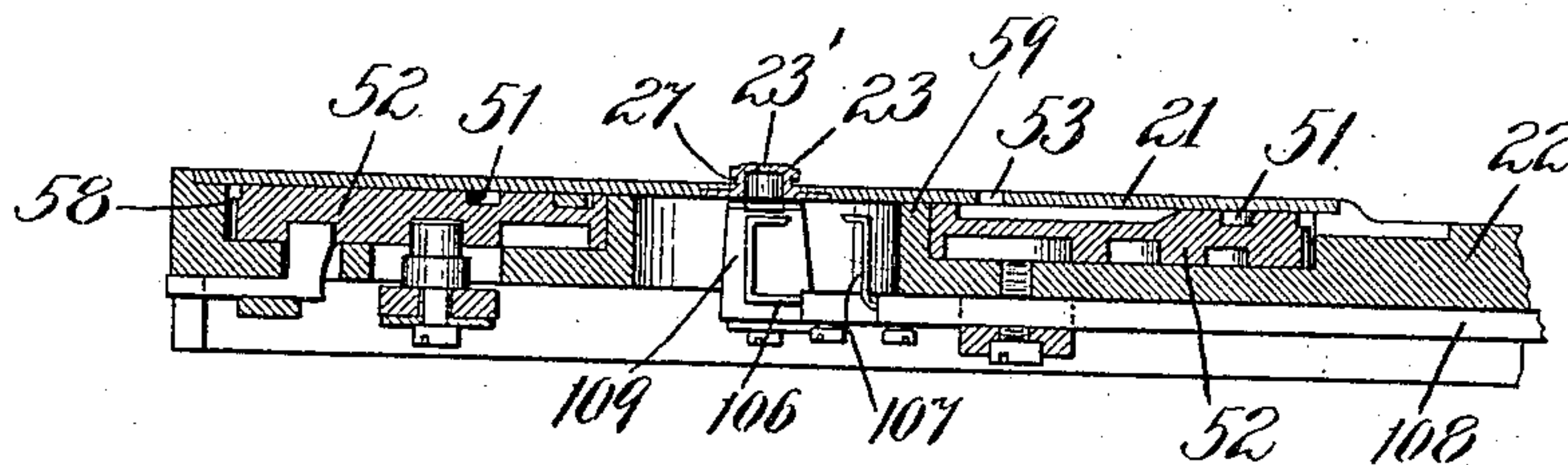


Fig. 7.

Witnesses:

Percy F. Wolfe.

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UNITED STATES PATENT OFFICE.

JOHN KIEWICZ, OF HYDE PARK, MASSACHUSETTS, ASSIGNOR TO WHEELER
MANUFACTURING COMPANY, A CORPORATION OF MAINE.

BUTTONHOLE-SEWING MACHINE.

No. 855,186.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed February 19, 1906. Serial No. 301,744.

To all whom it may concern:

Be it known that I, JOHN KIEWICZ, a subject of the Czar of Russia, residing at Hyde Park, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Buttonhole-Sewing Machines, of which the following is a specification.

This invention relates to certain improvements in machines for cutting and sewing button holes, the object of the invention being to provide a button hole sewing machine in which the cutting mechanism is so arranged relatively to the stitch-forming mechanism and to the fabric clamp and clamp feeding mechanism that the sewing of the button hole may be commenced immediately after the button hole has been cut in the fabric without moving the fabric clamp and the button hole cut in the fabric held thereby from the position in which said fabric clamp was located during the cutting of the button hole and before the commencement of the sewing of said button hole, thus saving the time occupied in machines of this class as heretofore constructed in which the button hole was cut in the fabric and then the fabric clamp and the fabric held thereby were of necessity moved forward by the operator into a position for the sewing operation to begin.

In machines of the class to which this invention belongs every motion of the operator which can be saved conduces to the speed with which the work can be finished and consequently increases the output of the machine.

The invention consists in certain improvements in the location of the cutting mechanism relatively to the fabric clamp and needle in connection with the work-plate and the clamp-actuating cam, whereby the results desired to be attained, as hereinbefore stated, are accomplished, all as set forth in the following specification and particularly as pointed out in the claims thereof.

Referring to the drawings: Figure 1 is a front elevation of a button hole sewing machine embodying my invention. Fig. 2 is a side elevation thereof, partly in section. Fig. 3 is an underneath plan of the same. Fig. 4 is a plan view of the work-plate and fabric clamp, together with a portion of the frame, broken away to save space in the drawings. Fig. 5 is a plan view, similar to

Fig. 4, with the fabric clamp removed and the lower cutter and fabric clamp pin shown in section. Fig. 6 is a section, partly in elevation, taken on line A—A of Fig. 4, looking toward the left in said figure. Fig. 7 is a section, partly in elevation, taken on line B—B of Fig. 3.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 15 is the frame of the machine, 16 the main driving shaft journaled in suitable bearings in said frame and rotated by a pulley 17. A bevel pinion 18, fast to the shaft 16, meshes into a bevel gear 19 fast to the vertical cam-shaft 20. A work-plate 21 is fastened to the bed-plate 22 of the frame 15 and to said work-plate is fastened a cylindrical needle-throat 23, which is provided with a passage 23' extending therethrough, through which a sewing machine needle 98 passes during the stitch-forming operation, as hereinafter described.

The fabric clamp 24 may be of any suitable construction, the particular form shown in the drawings being the same as that illustrated and described in an application for Letters Patent made by me Serial No. 257,683, filed April 27, 1905, allowed August 10, 1905 U. S. Patent No. 814,216. Said fabric clamp 24 consists of a base-plate 25 having a longitudinal slot 26 extending therethrough, the edges of said slot fitting into an annular groove 27 formed in the periphery of the needle throat 23. The base-plate 25 of said clamp has a bracket 28 extending vertically upward from the rear end thereof and is provided with a fabric-support in two parts 39 and 40 and with presser feet 32 and 33, said parts 39 and 40 of the fabric support and the presser feet 32 and 33 being so arranged that a piece of fabric may be clamped between said presser feet and fabric support and fed by said base-plate to the stitch-forming mechanism in a manner well known to those skilled in the art.

A vertical pin 46 is slidably mounted in the bracket 28 and is moved longitudinally thereof by means of a lever 47 pivoted to said bracket 28 and engaging the flange 48 formed upon the top of said pin 46. A spiral spring 49 fast at one end to said lever 47 and at the other end to the base-plate 25 holds the pin 46 normally down in the position illustrated in Fig. 6, the lower end of said pin

projecting through a slot 50 in the work-plates 21 and into a cam-groove 51 formed in the upper face of the clamp-actuating cam 52. The slot 50 in the work-plate 21 consists of a semi-circular portion 53 and two radial portions 54 and 55 extending outwardly from the opposite ends of said semi-circular portion 53, and a radial portion 140 which extends from one end of said semi-circular portion 53 inwardly to the needle throat 23. An opening 57 extends entirely through said cam 52. The cam 52 rotates in an annular recess 58 formed in the bed-plate 22 and is journaled upon a hub 59 formed upon said bed-plate (Fig 6). The cam 52 may be rotated either automatically, by a friction clamping mechanism actuated from the cam-shaft 20, or said cam may be rotated by hand by means of a pawl and ratchet mechanism, but as the mechanism for rotating said cam forms no part of this invention, a detailed description of the same is not considered necessary, as any suitable mechanism may be used for the rotation of said cam.

The particular stitch-forming mechanism illustrated in the drawings forms no part of this invention, but, briefly stated, consists of an upper needle bar 97 and needle 98 to which thread is fed from a spool 99, an upper gimp thread being fed to the upper side of the fabric from a spool 100. The upper needle bar 97 slides in ways formed in the rocker frame 101 pivoted to the frame of the machine, said rocker frame being rocked upon its pivot by a link 102, cam lever 103 and cam 104, thus bringing the needle alternately into alinement with the button hole and out of alinement therewith, so that the stitch first passes over one edge of the goods and then through the goods. The under thread is led from a spool 105 to the lower needle 106 which, together with the looper 107, is carried upon the reciprocatory slide bar 108 actuated by a cam (not shown) on the shaft 20. The spreader 109 is rocked at the proper time in the formation of the stitch by a cam lever 110 to which it is fastened, said cam lever being actuated by a cam groove 111 formed in the underside of the cam 86 fast to the lower end of the shaft 20. The lower gimp thread is led by suitable guides to the under side of the fabric from the spool 112.

The stitch forming mechanism forms no part of the present invention and is substantially the same as the stitch forming mechanism illustrated in the patents to William Raeuchler No. 574,166, dated December 29, 1896, button hole sewing machine, and No. 341,168, dated May 8, 1886.

The button hole is cut in the fabric by means of two cutters and mechanism to move said cutters toward each other. The upper cutter 113 is fastened to a reciprocatory slide 114, consisting, preferably, of a cylindrical bar guided in ways 115 formed in the frame

of the machine. A cam 116 is rotatably mounted upon the slidable rod 114, said cam having an inclined face 117 adapted to engage an incline 118 formed upon the under side of a plate 119 fast to the frame of the machine. The cam 116 has an arm 120 fast thereto provided with a handle 121. By pressing downwardly upon the arm 120 or handle 121, the cam 116 will carry the slide 114 downwardly, said cam being free to rotate upon the slide 114, but prevented from longitudinal motion by a shoulder 122 formed upon the slide 114 and by a nut 123 fast to the upper end thereof.

It will be seen that when the slide 114 has been sufficiently lowered so that the inclined face 117 comes substantially in alinement with the incline 118 formed upon the under side of the plate 119, if a rotary movement is then imparted to the cam 116, the inclined face 117 will contact with the incline 118 upon the fixed plate 119, and a continued rotation of the cam 116 will cause the slide 114 together with the upper cutter 113 to be forced downwardly, coöperating with the lower cutter 124, as hereinafter described, to cut a button hole in the fabric which is interposed between the upper and lower cutters.

The lower cutter 124 is fastened to an arm 125 pivotally supported upon two studs 126, 126 on the frame of the machine (Fig. 3). A rotary cam lever 127 is pivoted to a stud 128 fast to the bed-plate 22. Said lever has an inclined cam face 129 adapted to engage an incline 130 formed upon the arm 125, when said cam lever is rotated, and the rotation of said cam lever is secured by a link 131 pivotally connected at one end to an arm 132 of the cam lever 127, and at the other end thereof to a lever 133 pivoted at 134 (Fig. 1) to the frame 15 and projecting downwardly there-through through a slot 135 formed in the bed-plate 22. The upper left hand end of the lever 133 abuts against the under side of an arm 136 fast to the slide 114, and is kept in contact with said arm by a spiral spring 137, fast at one end to the frame of the machine and at the other end to the link 131 (Fig. 3).

The cutters 113 and 124 are both removable from their respective carriers in order that cutters of different lengths, for different sized button holes, may be used in the machine. It will be noted that the inner ends of the cutters 113 and 124, or the left hand end of said cutters as viewed in Fig. 2, pass very close to the needle throat 23, so that the end of the button hole farthest removed from the circular portion of said button hole, is close to the needle throat 23 and to the needle 98 when the cutters are brought together to cut the button hole, as hereinafter described.

The operation of the cutting mechanism, hereinbefore specifically described, is as follows: The fabric is clamped between the

presser feet 32 and 33 and the fabric support-
 ing parts 39 and 40, the clamp being in the
 position illustrated in Fig. 4. The operator
 moves the slide 114 and upper cutter 113
 5 downwardly by means of the arm 120 and
 handle 121. As said slide is pushed down-
 wardly in this manner, the lever 133 is rocked
 upon its pivot by the arm 136 fast to said
 slide 114, and through the link 131, which is
 10 thus moved toward the right (Fig. 3), the
 lower cutter 124 is rocked by its carrying
 arm 125, the incline 129 riding up on the in-
 incline 130, thus rocking the arm 125 upon its
 pivotal studs 126 and forcing the lower cut-
 15 ter upwardly through the opening 57 in the
 cam 52 and through the radial cutter slot 140
 in the work-plate 21 against the under sur-
 face of the fabric. The fabric is now firmly
 gripped between the two cutters and the op-
 20 erator gives a rotary motion to the cam 116,
 thus causing the incline 117 on said cam to
 ride downwardly upon the incline 118 formed
 upon the under face of the stationary plate
 119 and forcing the fabric downwardly, the
 25 lower sharp edged die cutter being thus
 forced through the fabric until it meets the
 descending lower face of said upper cutter.
 It will be seen that during this last motion
 of the upper cutter the lower cutter remains
 30 stationary and the upper cutter forces the
 fabric downwardly in a straight line against
 the cutting edge of the lower cutter, and also
 it will be seen by reference to Figs. 1 and 5
 that the cutters operate close to the needle
 35 throat during the cutting of the fabric and
 that the fabric clamp is in position to begin
 the sewing of the button hole as soon as the
 cutters are removed by reversing the motion
 of the cam 116 handle 121 and arm 120,
 40 hereinbefore described. The operator now
 starts the machine by throwing into action
 the proper clutch (not shown in the draw-
 ings) for the rotation of the main driving
 shaft 16. The stitch forming mechanism
 45 now begins its action and the needle alter-
 nately enters the button hole which has been
 cut and passes through the fabric at one side

of said button hole, while the fabric clamp
 carries the fabric forward in a straight line
 for one side of the button hole until it is fed 50
 forward far enough to perform the sewing
 about the circular portion of the button hole
 at one end thereof. During this portion of
 the sewing of the button hole the pin 46
 passes forwardly along the radial portion 55, 55
 the remainder of the sewing of the button
 hole being performed in a manner well known
 to those skilled in this art, the pin 46 passing
 around the semi-circular portion 53 and then
 along the radial portion 54, thus completing 60
 the feed of the clamp and the sewing of the
 button hole.

Having thus described my invention, what
 I claim and desire by Letters Patent to se-
 cure is:

In a button hole sewing machine a needle
 throat provided with a passage extending
 therethrough and adapted to guide a needle,
 a work-plate through which said needle
 throat projects, said work-plate provided 70
 with a slot consisting of a semi-circular por-
 tion concentric with said needle throat and
 two radial portions extending outwardly
 from the opposite ends of said semi-circular
 portion and a radial portion extending from 75
 one end of said semi-circular portion to said
 needle throat; in combination with a pair of
 cutters, one of said cutters located above and
 the other below said work-plate, mechanism
 to move said cutters toward and away from 80
 each other and through said last named
 radial portion of said slot, a fabric clamp
 actuating cam provided with a groove in one
 face thereof, a fabric clamp slidable upon
 said needle throat and rotatable thereon, and 85
 a pin carried by said clamp and projecting
 through said slot and into said cam groove.

In testimony whereof I have hereunto set
 my hand in presence of two subscribing wit-
 nesses.

JOHN KIEWICZ.

Witnesses:

CHARLES S. GOODING,
 ANNIE J. DAILEY.