

No. 765,051.

PATENTED JULY 12, 1904.

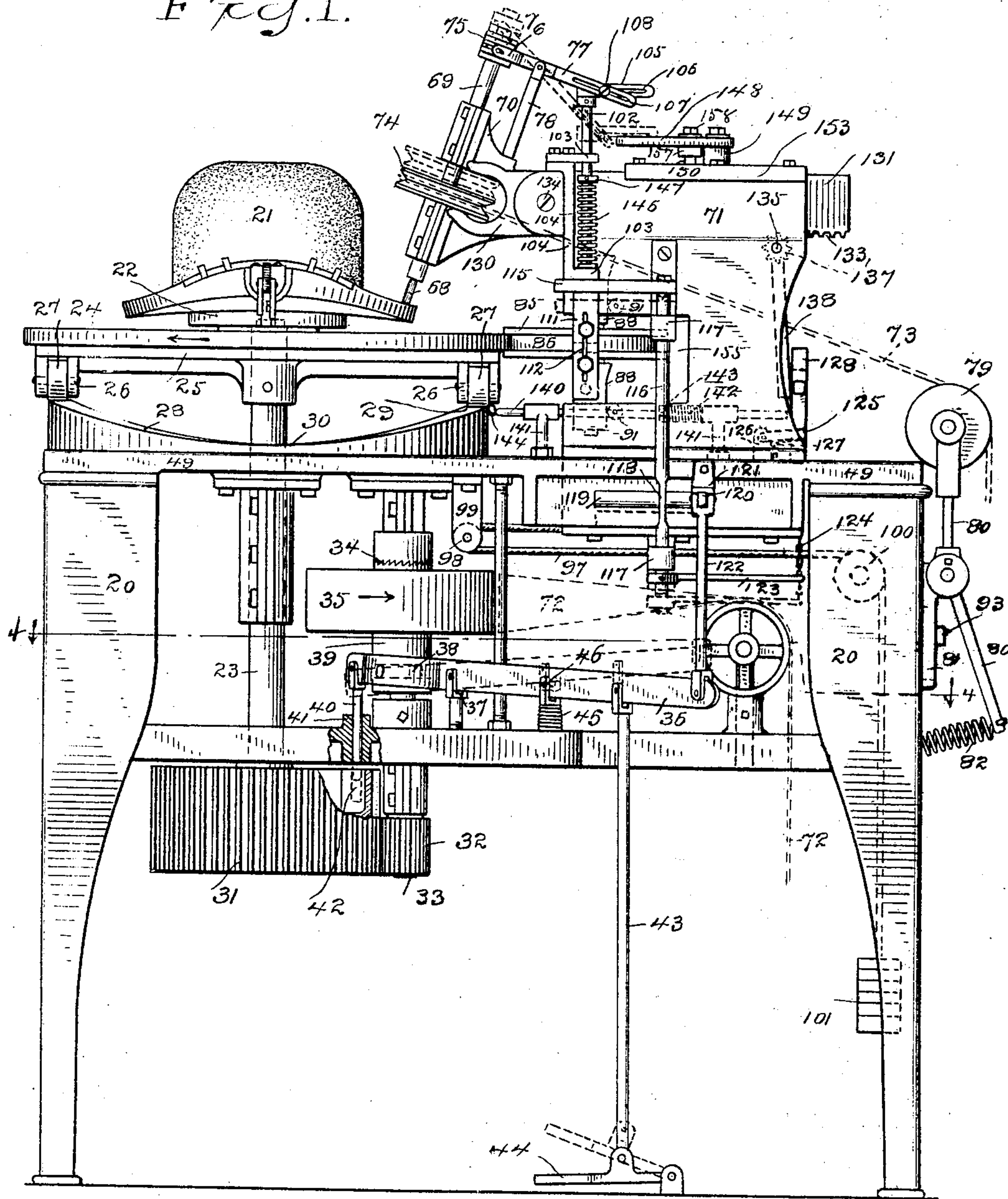
C. I. STERLING.  
HAT PARING MACHINE.

APPLICATION FILED JULY 27, 1903.

NO MODEL.

6 SHEETS—SHEET 1.

Fig. 1.



WITNESSES.

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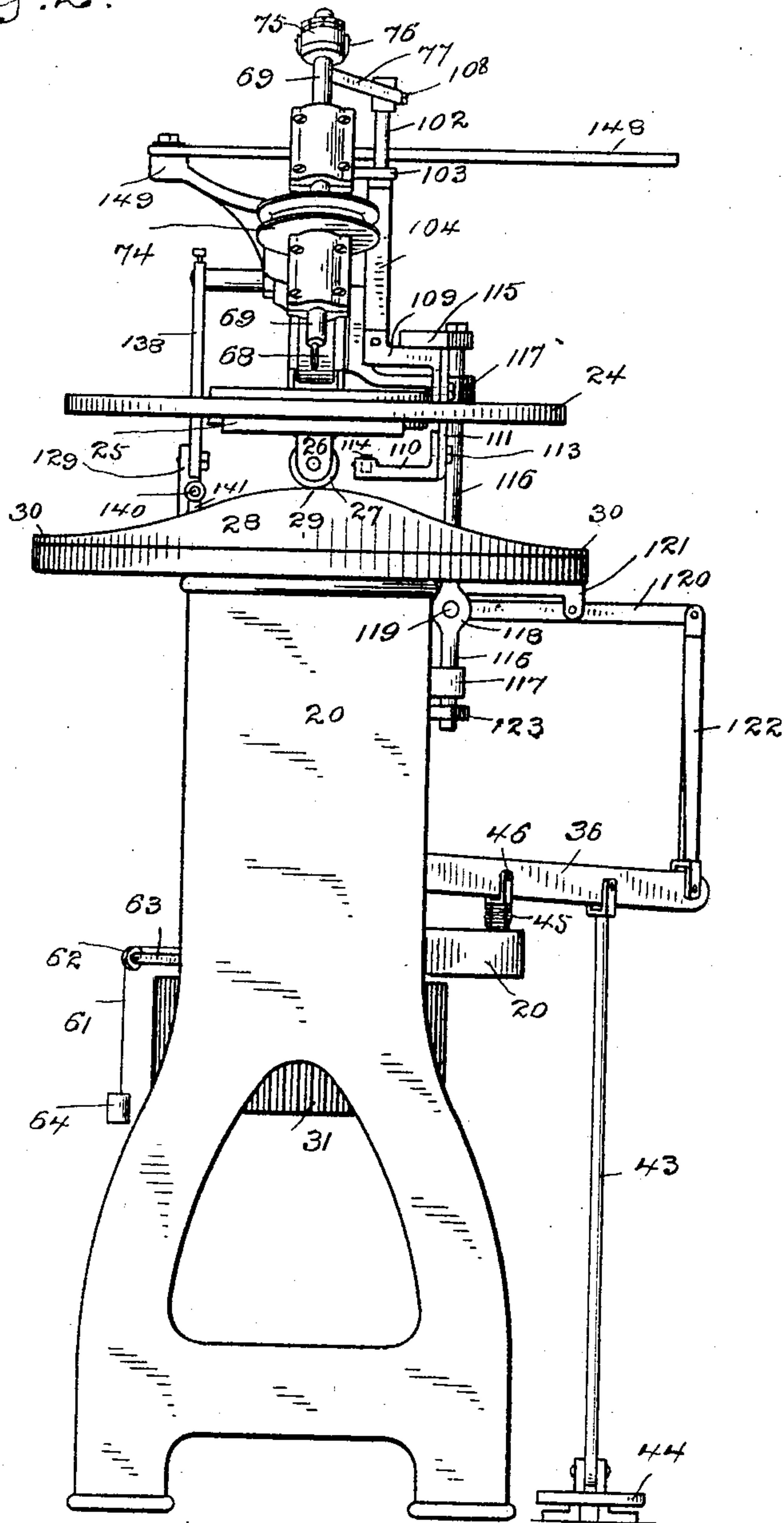
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6 SHEETS—SHEET 2.

Fig. 2.



WITNESSES.

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6 SHEETS—SHEET 3.

Fig. 3.

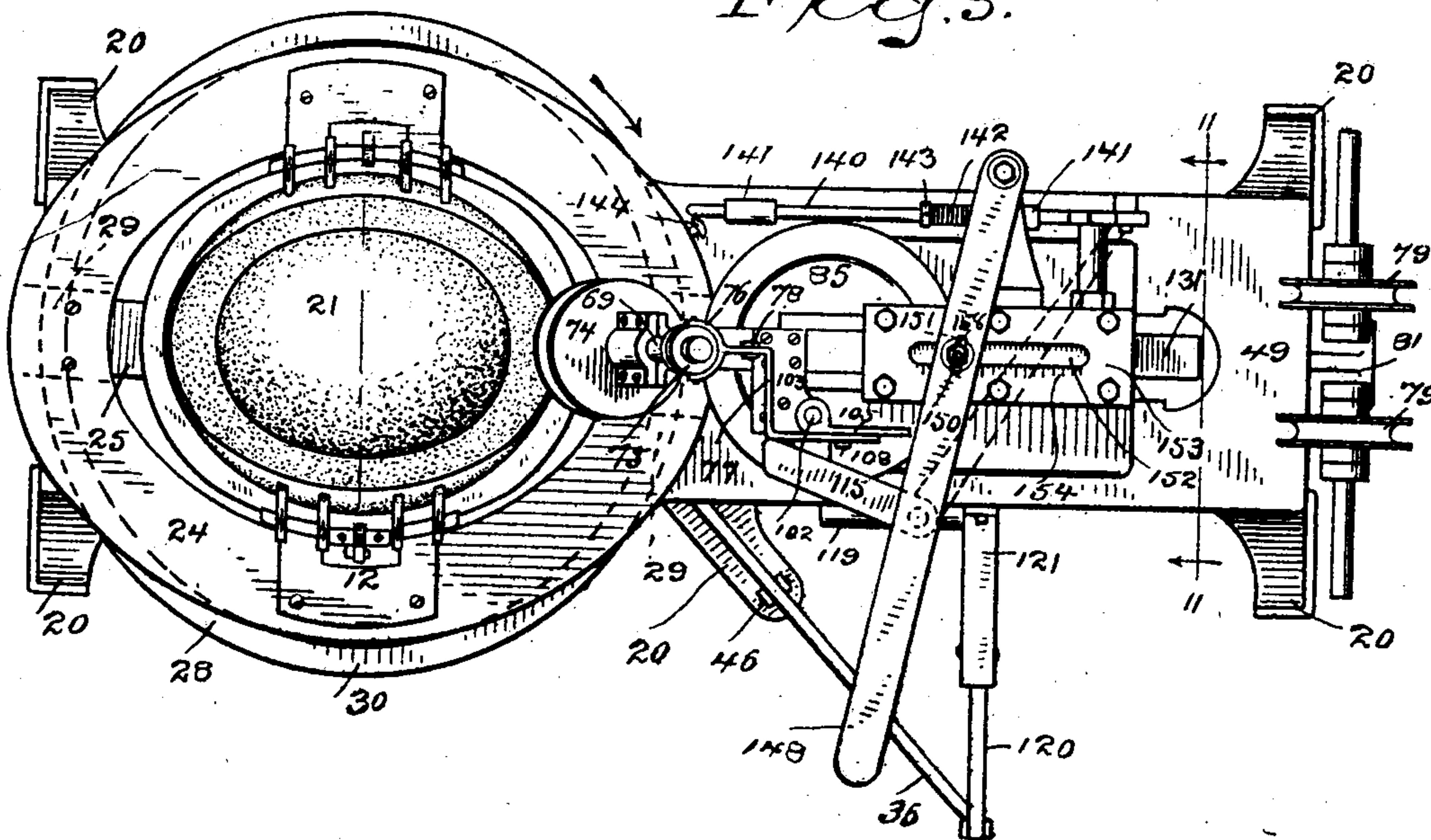
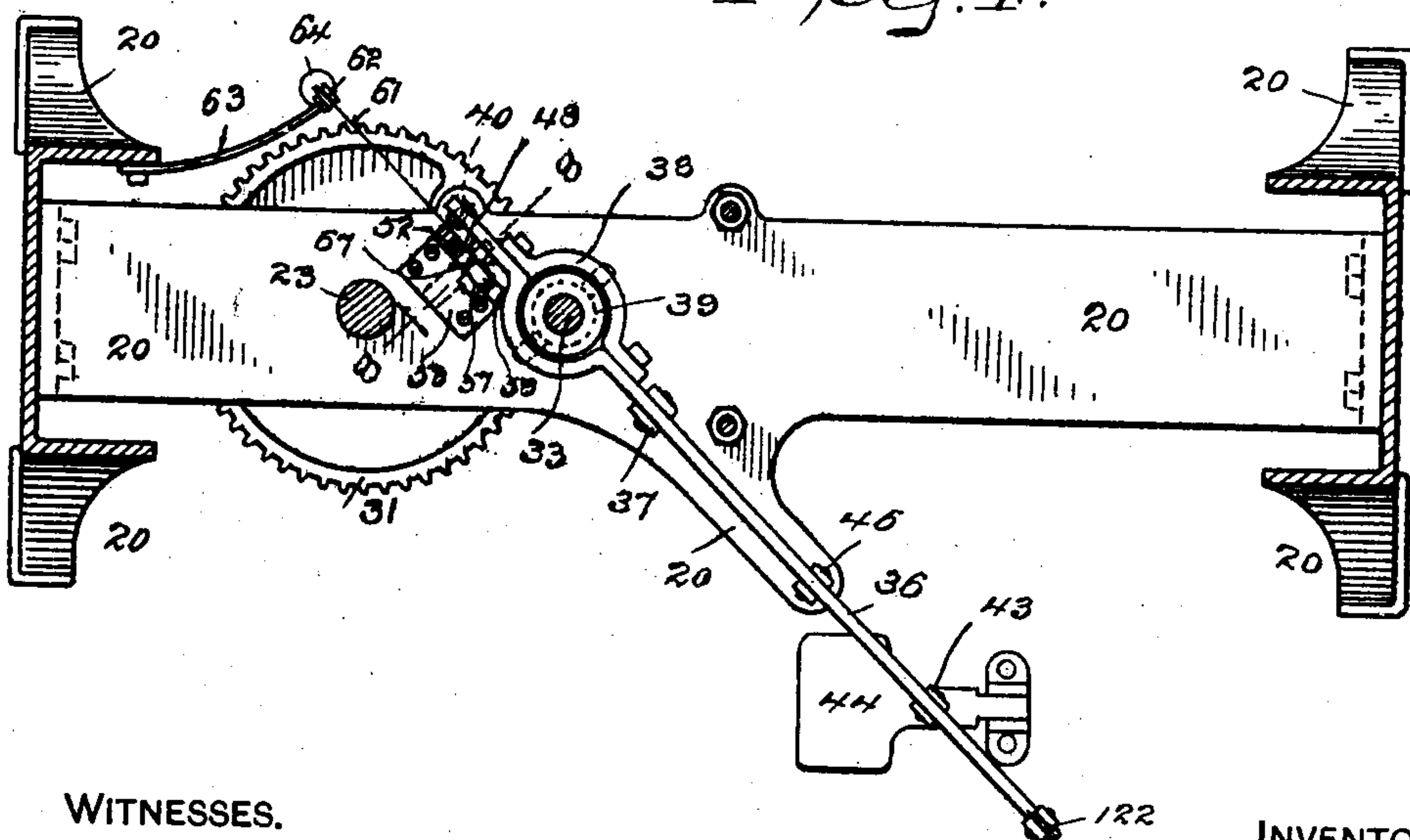


Fig. 4.



WITNESSES.

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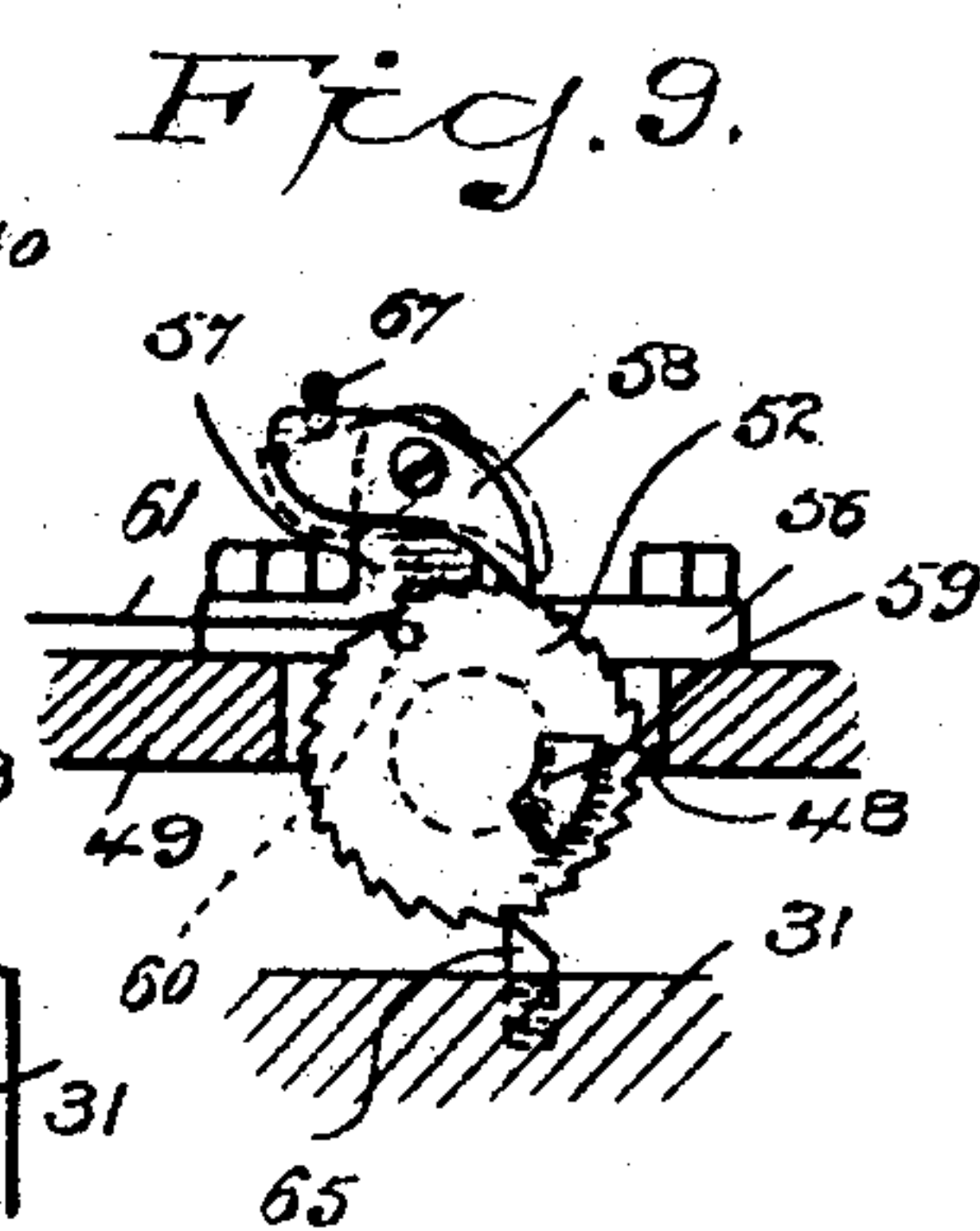
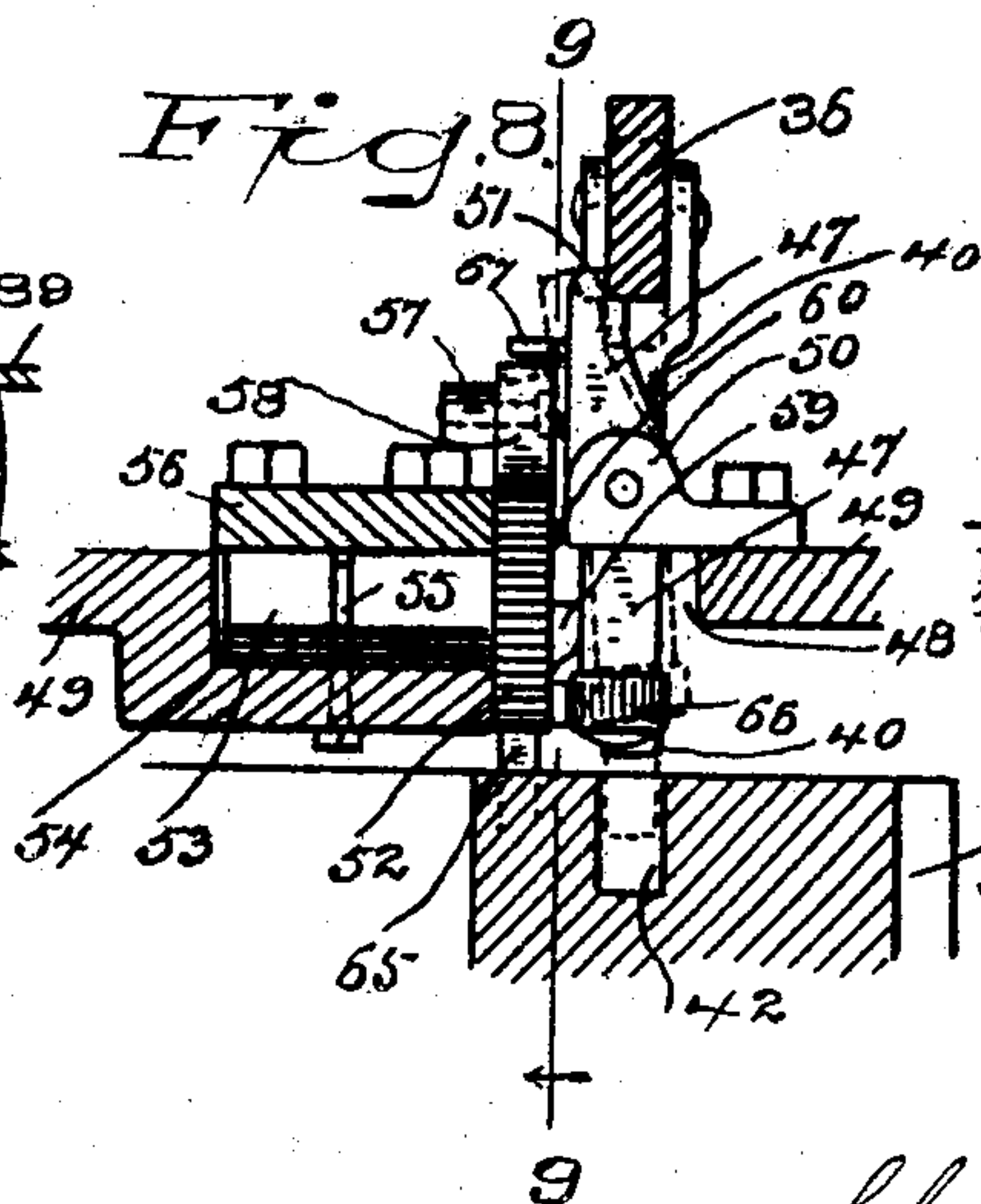
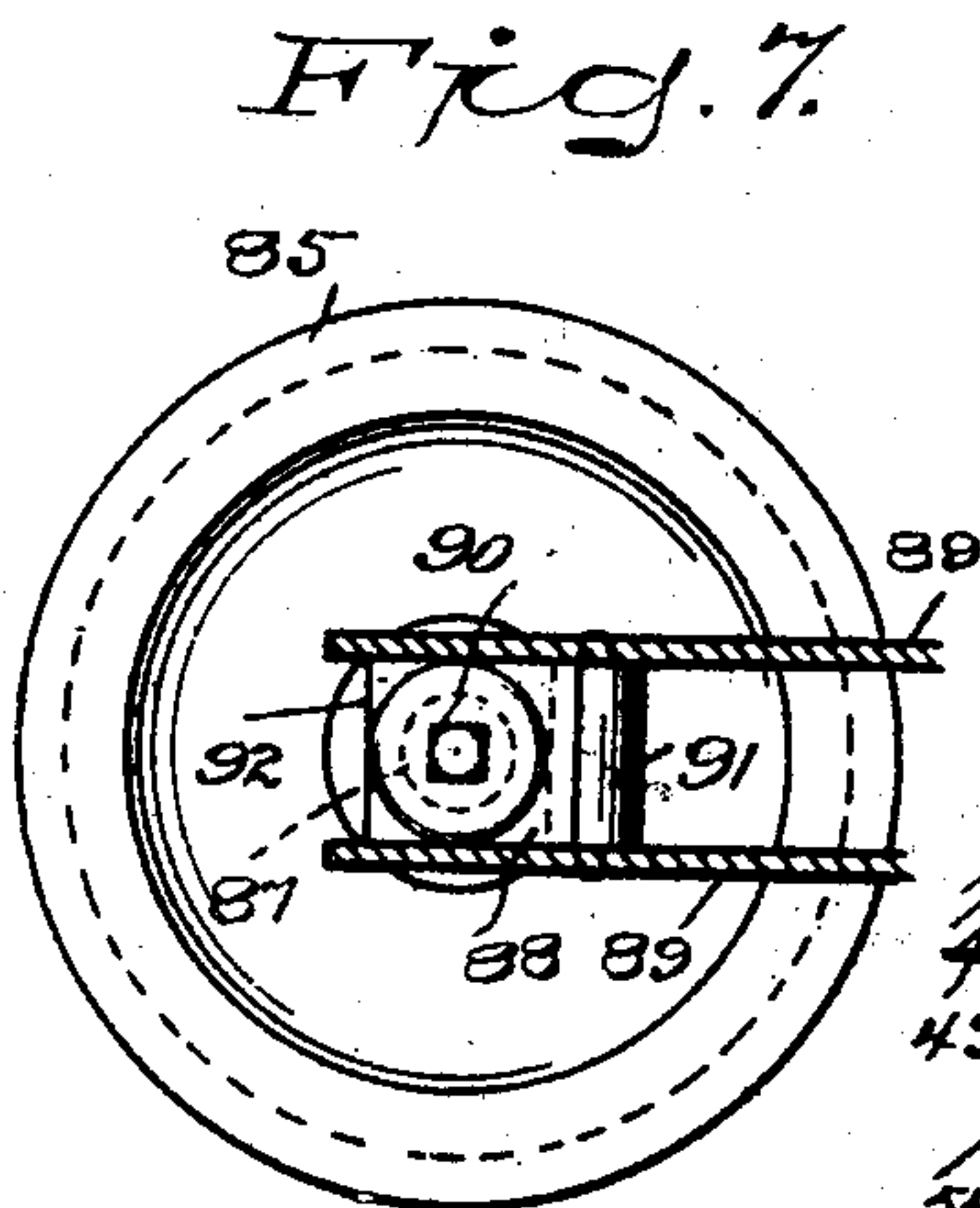
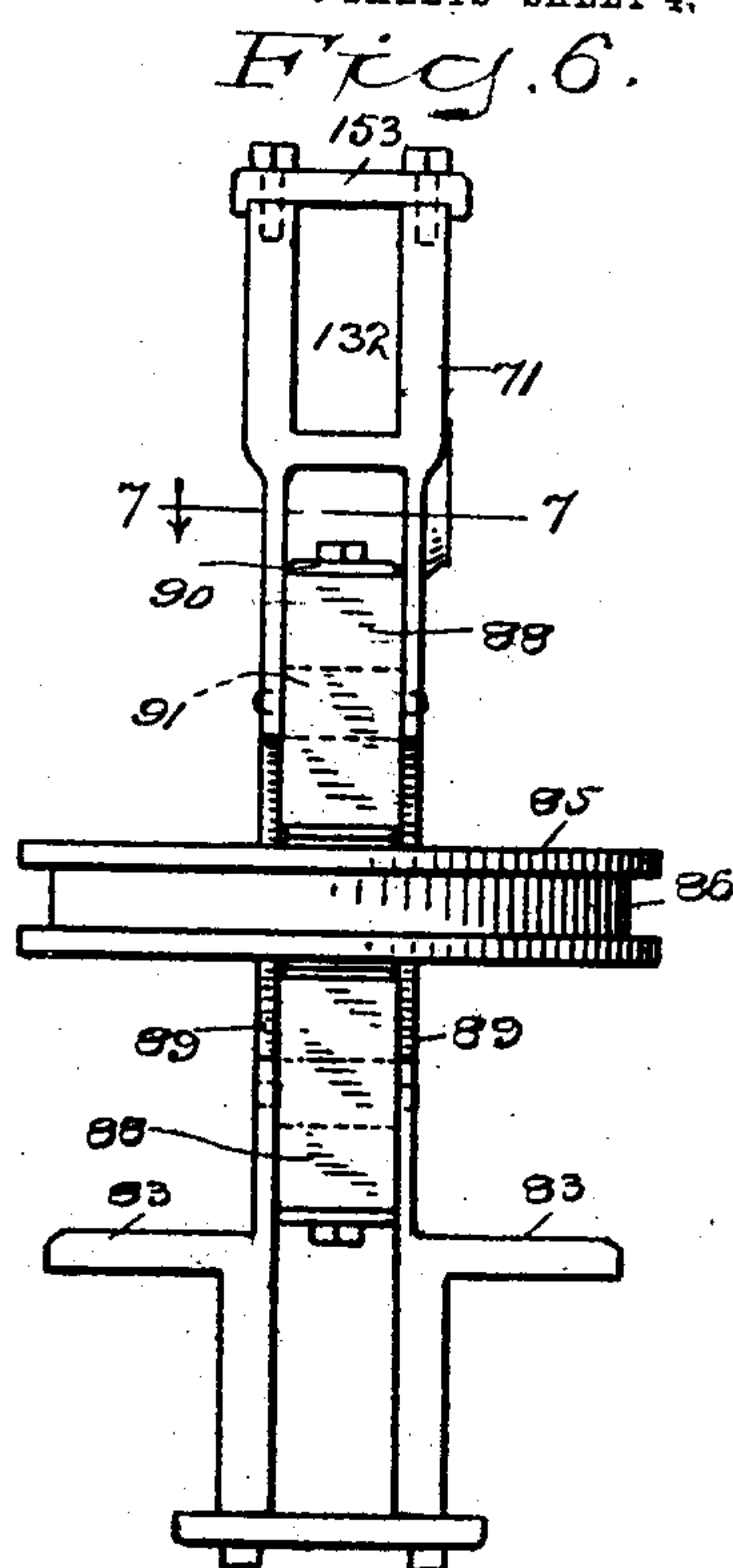
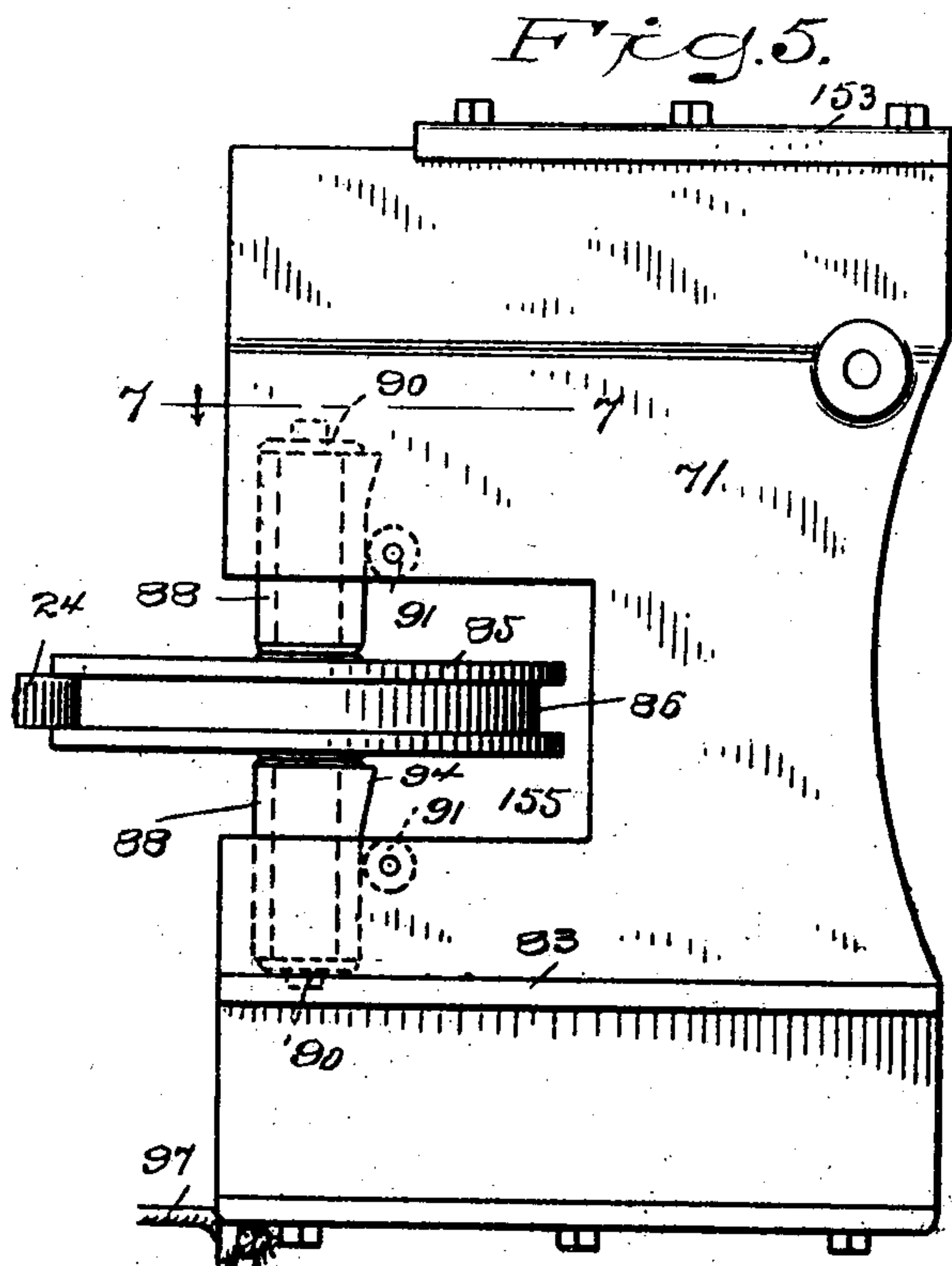
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6 SHEETS—SHEET 4.



WITNESSES.

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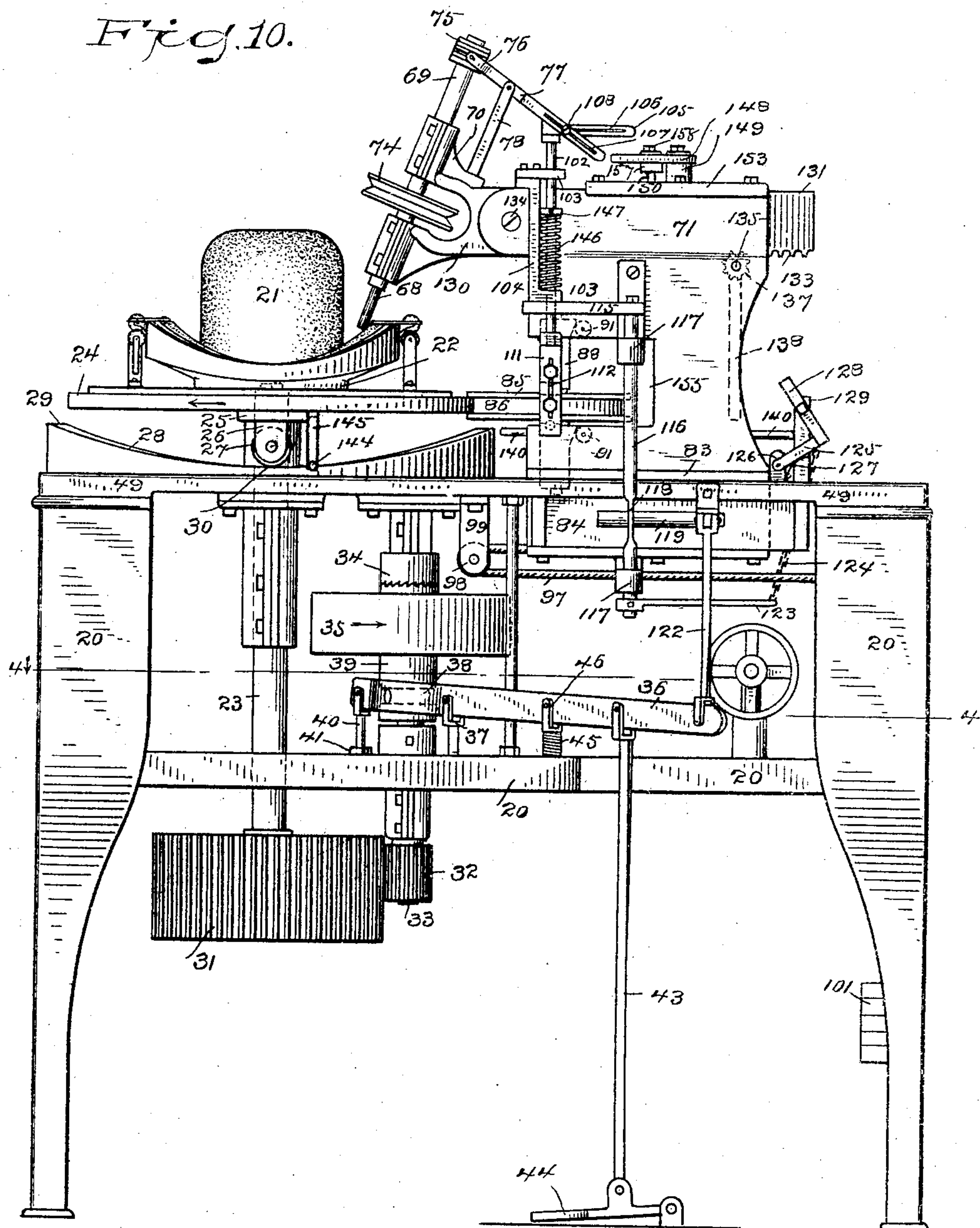
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NO MODEL.

6 SHEETS—SHEET 5.



WITNESSES.

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NO MODEL.

6 SHEETS—SHEET 6.

Fig. 11.

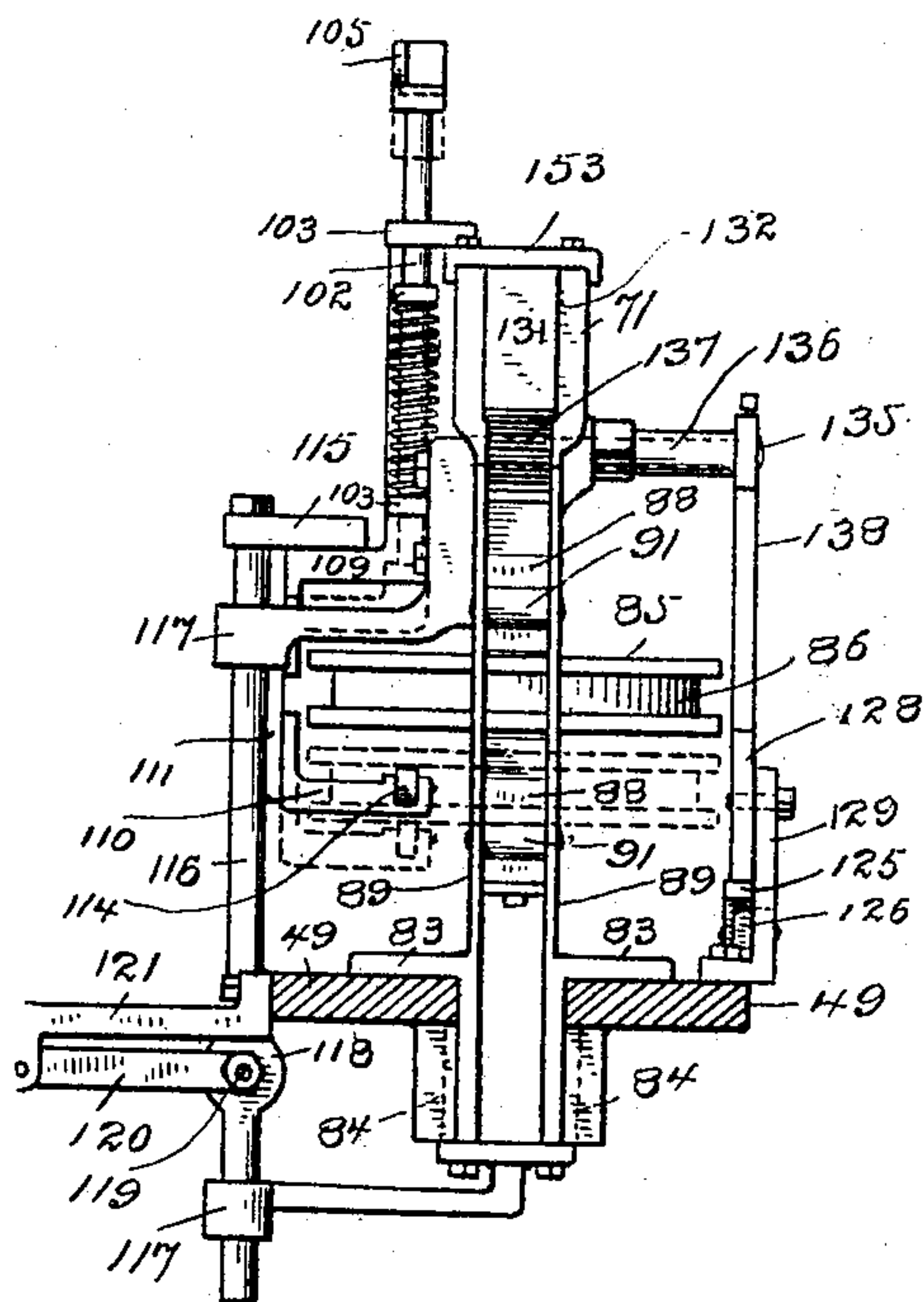


Fig. 12.

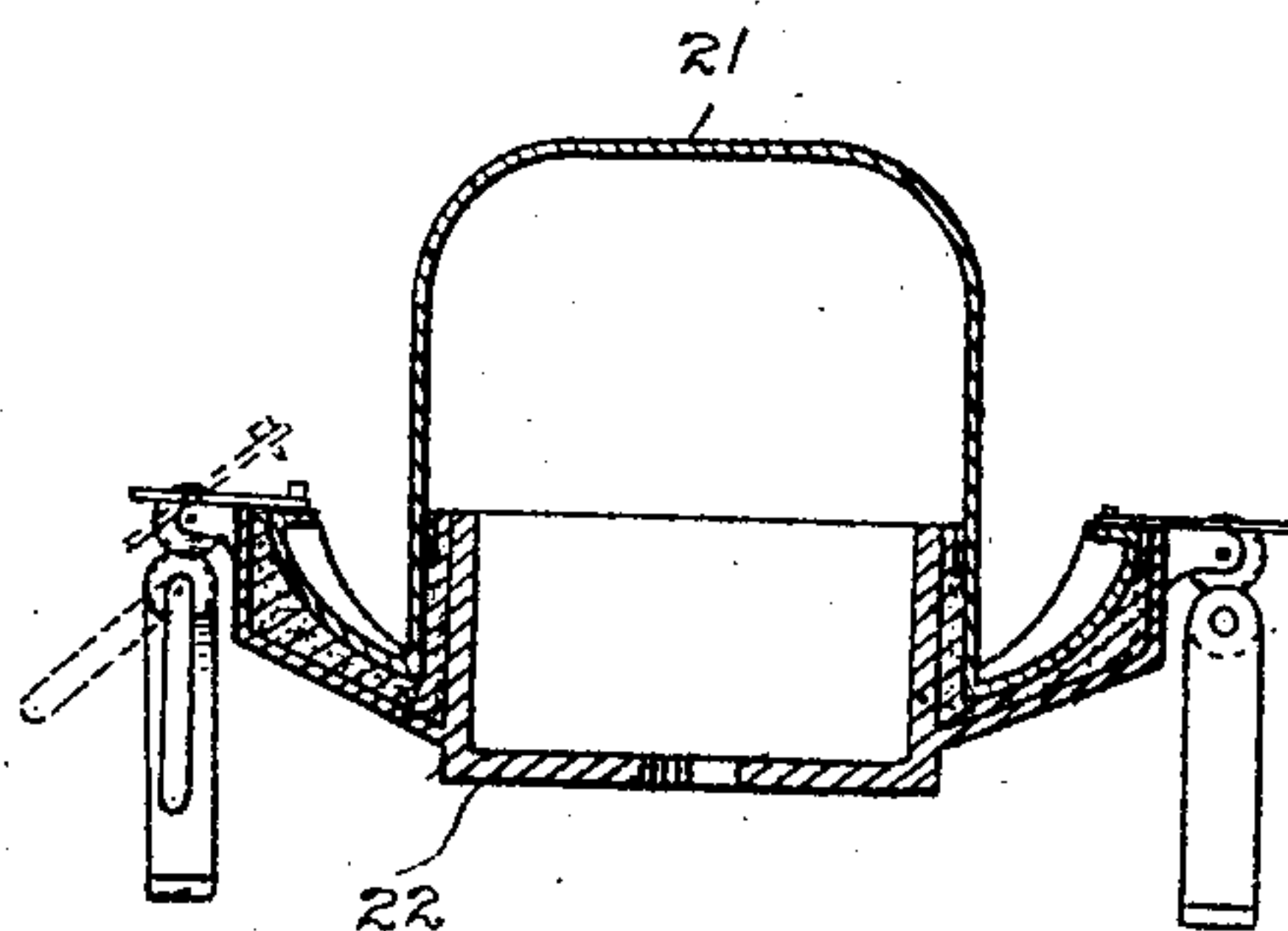


Fig. 13. Fig. 14. Fig. 15. Fig. 16.

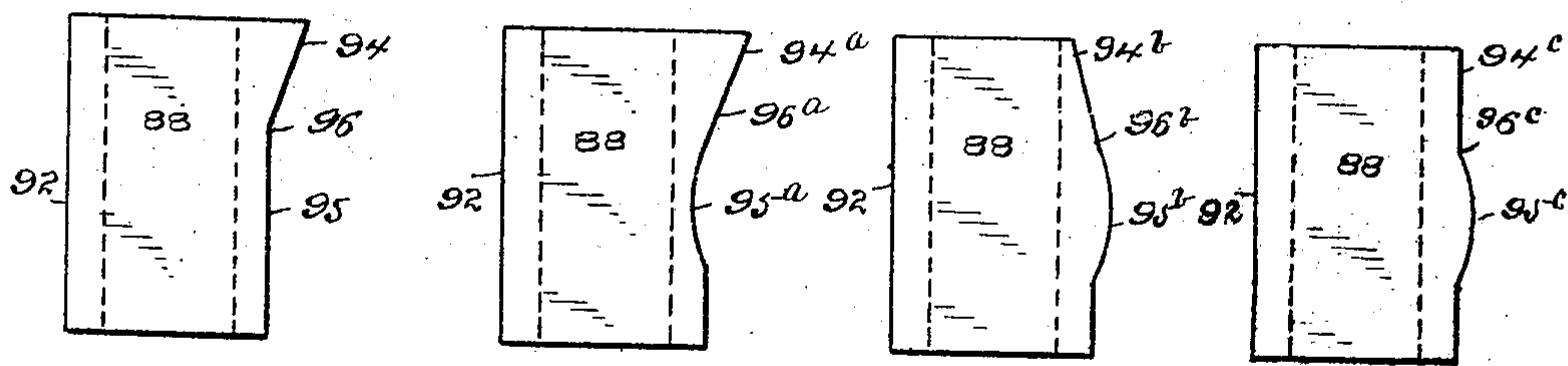
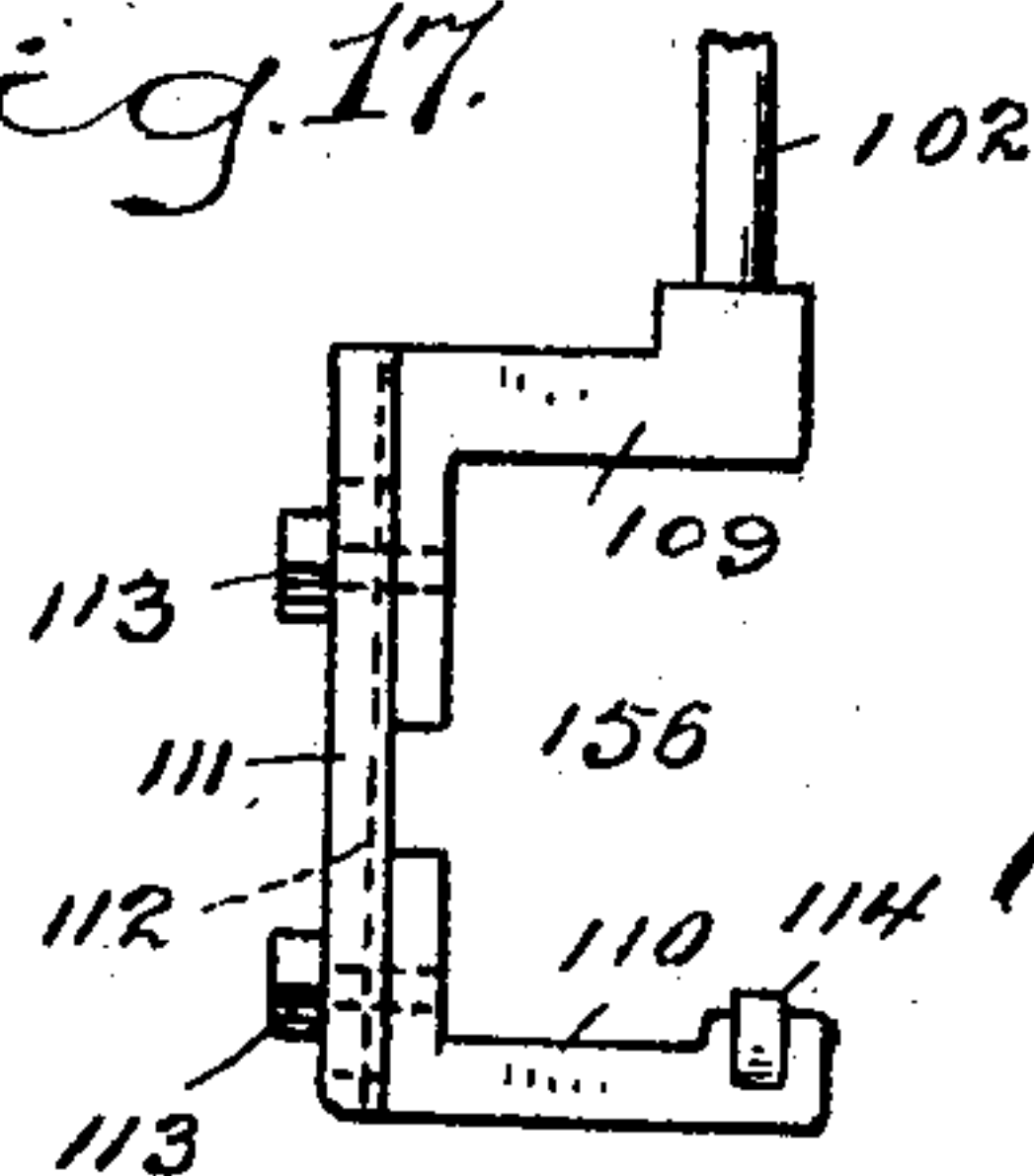


Fig. 17.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

CHARLES I. STERLING, OF SOUTH NORWALK, CONNECTICUT.

## HAT-PARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 765,051, dated July 12, 1904.

Application filed July 27, 1903. Serial No. 167,157. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES I. STERLING, a citizen of the United States, residing at South Norwalk, county of Fairfield, State of Connecticut, have invented a new and useful Hat-Paring Machine, of which the following is a specification.

My invention relates to the manufacture of hats, and has for its object to produce a machine for performing in an improved manner the final operation upon the brims of curled hats, which is variously termed "trimming," "planing," or "paring"—that is, paring off or removing from the edges of the brims surplus stock, leaving the bodies ready for the finishing operations—which shall be rapid and wholly automatic in operation, will leave the edges of the brims perfectly clean and free from fuzz, as each body makes two revolutions, the first to remove the bulk of the stock and the second to finish the edge, which shall be perfectly certain and reliable in operation, capable of effecting a great saving in the cost of the operation, and requiring but few adjustments in changing to different sizes and styles of bodies and those inexpensive and easily and quickly made.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, which will be hereinafter described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, forming a part of this specification, in which like characters of reference indicate the same parts, Figure 1 is a side elevation of the machine complete, the position of the parts being shown at the instant of starting; Fig. 2, an end elevation as seen from the left in Fig. 1, the hat-holder being removed; Fig. 3, a plan view corresponding with Fig. 1; Fig. 4, a section on the line 4 4 in Figs. 1 and 10 looking down; Fig. 5, a detail view, on an enlarged scale, showing the cutter-carrier, grooved wheel, and pattern-blocks in side elevation, the cutter-bracket, slide, and other parts being removed; Fig. 6, an end elevation as seen from the left in Fig. 5; Fig. 7, a detail sectional view on the line 7 7 in Figs. 5 and 6 looking

down; Fig. 8, a detail sectional view, on an enlarged scale, on the line 8 8 in Fig. 4; Fig. 9, a detail sectional view on the line 9 9 in Fig. 8; Fig. 10, a side elevation of the entire machine, certain parts being omitted for the sake of clearness, showing the position of the operative parts when the hat-holder has made one and one-fourth turns—that is to say, when the roughing cut has been completed and the hat-holder and hat have made a quarter-turn on the finishing cut; Fig. 11, a section on the line 11 11 in Fig. 3 looking toward the left; Fig. 12, a section of a hat-holder with a hat-body thereon on the line 12 12 in Fig. 3; Figs. 13, 14, 15, and 16, detail views illustrating different forms of pattern-blocks, and Fig. 17 is a detail view illustrating the adjustment at the lower end of the cutter-lifting rod.

20 denotes framework, which may of course be of any ordinary or preferred construction; 21, a hat-body that is being operated upon, and 22 a holder therefor, which may be of any ordinary or preferred construction and is detachably secured to the machine.

The drawings illustrate, without going into details, a form of hat-holder which I preferably use and have made the subject of an independent application, Serial No. 160,998, filed June 11, 1903. It should be understood, however, that my present machine is not limited in its operation to any special form of hat-holder, it being simply required that the hat-bodies to be operated upon be firmly secured to holders adapted to be quickly attached to and removed from the machine in any ordinary or preferred manner.

In use the hat-holder is attached to and receives rotary motion and simultaneous vertical reciprocatory motion from a vertical shaft 23, journaled in suitable bearings upon the framework. At the upper end of this shaft is an oval pattern-plate 24, which determines the path traced by the cutter, except as the path of the cutter is modified by the pattern-blocks, as will presently be fully explained. In the present instance the pattern-plate is secured to a cross-piece 25, which is itself rigidly secured to the shaft. At the ends of the cross-piece are yokes 26, in which are journaled rollers 27, which travel on a track-



plate 28, which is itself rigidly secured to the framework. The operative surface of the track-plate is a double reversed curve comprising two high portions 29 and two low portions 30, the high portions acting to raise the shaft, pattern-plate, and hat-carrier, so that the cutter will act upon the low portions of the brim of a hat-body on a holder, as clearly shown in Fig. 1, in which the cutter is shown as acting upon one end of the brim and the low portions of the track-plate, permitting the shaft, track-plate, and hat-holder to drop by their own weight, so that the cutter will act upon the high portions of the brim of a hat-body on a holder, as in Fig. 10, in which the cutter is shown as acting upon one side of the brim at the highest portion. At the lower end of shaft 23 is a gear-wheel 31, which meshes with a pinion 32 on a driving-shaft 33, also journaled in the framework, the gear-wheel being made amply wide to permit vertical movement of the shaft without disengagement from the pinion.

34 denotes a clutch, one member of which is rigidly secured to the driving-shaft, the other being formed upon the hub of a belt-pulley 35, which is loose upon said shaft. Power is applied to drive the machine by means of a belt 72, (see dotted lines, Fig. 1,) passing over this pulley. In use the belt-pulley is always running. The clutch is operated to connect and disconnect the belt-pulley and driving-shaft by means of a lever 36, fulcrumed, as at 37, and having at its forward end a collar 38, which incloses loosely the hub 39 of the belt-pulley and is connected thereto by means of the usual pin-and-groove connections. (See Fig. 4.) At the extreme forward end of lever 36 is pivoted a depending pin 40, which passes through a hub 41 in the framework and is adapted to engage a socket 42 in gear-wheel 31 to stop the rotation of the gear-wheel, shaft, hat-holder, &c., at the end of the second revolution, as will be more fully explained. Lever 36 is operated to start the machine by means of a rod 43, extending to a foot-lever 44. A spring 45, bearing against the framework and against a yoke 46, pivoted to lever 36, acts to normally raise the rear end of lever 36 and correspondingly depress the forward end thereof, which separates the clutch members, and places pin 40 in engagement with the socket in the gear-wheel, as indicated by dotted lines in Fig. 1.

To start the machine, therefore, a hat-body upon a holder being secured in place upon shaft 23, the operator presses down upon the foot-lever, moving it from the position shown in dotted lines in Fig. 1 to the position shown in full lines in said figure and in Fig. 10 against the power of spring 45, which disengages pin 40 from the gear-wheel and places the clutch members in engagement, so that the rotation of belt-pulley 35 is communicated

to the driving-shaft and through the pinion 65 and gear-wheel to shaft 23.

As the trimming of a hat-body requires two revolutions of shaft 23, by which it is carried, I provide automatic mechanism, which I will now describe, which acts to retain the clutch members in engagement until the completion of the second revolution of shaft 23, when said mechanism acts automatically to disconnect the clutch members and stop the rotation of the gear-wheel through the engagement therewith of pin 40.

Turning now to Figs. 4, 8, and 9, 47 denotes a gravity locking-lever lying in an opening 48 in the bed, which is specifically indicated by 49 and shown as pivoted to a bracket 50, itself rigidly secured to the bed. At the upper end of the locking-lever is a notch 51, which is engaged by operating-lever 36 the instant said lever is raised through the operation of the foot-lever, the locking-lever being so shaped and weighted that it will swing under the operating-lever and lock it in the raised or operating position, as clearly shown in Fig. 8.

52 denotes a ratchet carried by a shaft 53, journaled in a socket 54 in the bed, in which it is retained by a pin engaging a groove 55 in the shaft. Socket 54 is shown as covered by a plate 56, which is bolted to the bed and is provided with an ear 57, carrying a pawl 58, which engages the ratchet and normally locks it against backward movement. This ratchet is provided on its outer face with a lug 59 and on its inner face with a pin 60, to which a cord 61 is attached, said cord passing over a pulley 62 on an arm 63, extending from the framework and being provided at its lower end with a weight 64. (See Fig. 4 in connection with Fig. 9.) 65 denotes a lug on the upper face of gear-wheel 31, which at the completion of the first revolution of said gear-wheel and shaft 23 engages the ratchet and carries it forward until it passes out of engagement. In the present instance lug 65 carries the ratchet forward two teeth, in which position it is retained by the pawl. At the completion of the second revolution of shaft 23 and the gear-wheel lug 65 will again engage the ratchet and carry it forward, this movement of the ratchet causing lug 59 on the ratchet to engage the lower end of locking-lever 47, tripping said lever and moving it out of engagement with the operating-lever, so that spring 45 can act to raise the rear end of said lever, depressing the front end thereof and placing pin 40 in engagement with socket 42 in the gear-wheel, thereby locking the latter and stopping the rotation of shaft 23 of the hat-holder. I have shown the lower end of the locking-lever as provided with a roller 66, which acts as a weight and is engaged by the lug on the ratchet. 67 denotes a pin near the upper end of the locking-lever, which when said lever is tripped by the engagement



therewith of lug 59 on the ratchet engages the pawl, as clearly shown in Fig. 9, and depresses the rear end thereof, causing the forward end of the pawl to release the ratchet, so that weight 64 will return the ratchet to its normal position, as in Fig. 9—that is, to the starting position—the foot-lever being now of course at the raised position, as indicated by dotted lines in Fig. 1. The operator then removes the holder and trimmed hat-body, places another holder with a hat-body thereon in place upon shaft 23, and starts the machine, as before, by again depressing the foot-lever. 68 denotes the cutter, which is of the rotating type and is carried by a shaft 69, journaled on a bracket 70, pivoted to a slide 131, adjustable in a carrier 71, which itself reciprocates on the bed. The cutter is rotated at a high velocity by means of a belt 73, (see dotted lines, Fig. 1,) which passes over a belt-pulley 74 on shaft 69. Cutter-shaft 69 is free to move longitudinally in its bearings and has rigidly secured thereto a grooved collar 75, which is engaged by pins extending inward from a yoke 76 on a lever 77, fulcrumed on an arm 78, extending upward from cutter-bracket 70. In order to retain belt 73 tight at all times, while permitting reciprocatory movement of the carrier, I pass said belt over pulleys 79, carried by levers 80, journaled in a bracket 81 and controlled by springs 82, the ends of which are attached, respectively, to levers 80 and to the framework, which act to hold said pulleys in contact with the belt, taking up the slack at all times, but permitting free reciprocatory movement of the carrier. Bracket 81 is shown as vertically adjustable on the framework and as locked in position by means of bolts 93, which pass through slots in the bracket.

It will of course be understood that the special design of carrier 71 and the manner in which the parts thereof are secured together are not of the essence of the invention. The carrier detached is clearly shown in Figs. 5 and 6, and the manner in which flanges 83 rest upon bed 49, on which the carrier reciprocates, is clearly shown in Fig. 11, likewise the manner in which the carrier is supported vertically by webs 84, which are cast integral with and extend downward from the bed. The reciprocatory movement of the carrier on the bed is produced by pattern-plate 24 and a cord and weight operating in connection therewith, as will presently be explained.

85 denotes a wheel having a circumferential groove 86, which receives and retains the edge of the pattern-plate. This wheel is carried by a shaft 87, (see dotted lines, Fig. 5,) which is itself carried by pattern-blocks 88, lying, respectively, above and below the wheel and which coact with the pattern-plate to determine the path traveled by the cutter. These pattern-blocks are adapted to slide both vertically and horizontally between the side plates

89 of the carrier, the shaft being fastened in the blocks in any suitable manner, as by nuts and washers, (indicated by 90,) which engage reduced threaded ends of the shaft. The pattern-blocks are used in pairs, as shown, and are constantly engaged by rollers 91, journaled between the side plates of the carrier. As already stated, the carrier is adapted to reciprocate on the bed. Wheel 85 and the pattern-blocks are not, however, in any way secured to the carrier, said pattern-blocks being free to slide between the side plates 89 of the carrier both vertically and horizontally and independently of the movements of the carrier, a recess 155 being provided in the carrier to receive the wheel and permit both vertical and horizontal movement thereof. The vertical movements of said wheel and the pattern-block are produced by the engagement of the wheel with the pattern-plate, the wheel necessarily rising and falling with the pattern-plate and when required for hats having a high curl at the sides producing a vertical movement of the cutter-lifting rod and cutter, as will presently be fully explained. The horizontal movements of the carrier and also the pattern-blocks and wheel 85 (which move together) are controlled by the pattern-plate in connection with a cord and weight. (A spring may of course be substituted, if preferred.)

97 denotes a cord which is rigidly secured to the carrier, passes over a roller 98, journaled in a bracket 99, which depends from the bed, and over a roller 100, journaled in the framework, (see dotted lines, Fig. 1,) and carries at its other end a weight or weights 101, the action of which is to move the carrier upon the bed toward the left, as seen in Figs. 1 and 10, the effect of which is twofold—first, to retain the bottom of the groove in wheel 85 closely in engagement at all times with the periphery of the pattern-plate which lies in the groove, as clearly shown, and, second, to retain rollers 91 upon the carrier closely in engagement with the faces of the pattern-blocks. It will be obvious, therefore, that the action of the pattern-plate is to move wheel 85 toward the right from the position shown in Fig. 10—that is, toward the position shown in Fig. 1—and that this movement of wheel 85, through the engagement of the pattern-blocks moving therewith with rollers 91 upon the carrier, is to move the carrier correspondingly toward the right. The action of the weight is to move the carrier toward the left from the position shown in Fig. 1—that is, toward the position shown in Fig. 10—the primary effect of which is to retain rollers 91 upon the carrier closely in engagement with the pattern-blocks, and the secondary effect is to transmit the power of the weight through the pattern-blocks to wheel 85 and to retain the bottom of the groove in said wheel closely in engagement with the periphery of the pat-



tern-plate. Each pattern-block is provided with a straight face, which I have indicated as a whole by 92, and with an irregular face, which may be divided into three operative portions—an upper operative portion, (indicated by 94,) which acts to modify the path traveled by the cutter at the sides of the brim of a hat, as shown in Fig. 10, a lower operative portion, (indicated by 95,) which acts to modify the path traveled by the cutter at the ends of the brim, as shown in Fig. 1, and a central operative portion, (indicated by 96,) which acts to modify the path traveled by the cutter at the intermediate points—that is, at the quarters of the brim. The configuration of pattern-plate 24 is what may be termed the “ordinary oval” of a hat-brim. When it is desired to have the cutter trace this oval, the pattern-blocks are reversed from the position shown in Figs. 1 and 10, so that the straight faces 92 thereof will be engaged by rollers 91 upon the carrier. This reversed position of the pattern-blocks is not shown in the drawings.

It is deemed sufficient for the purposes of this specification to state that the straight face 92 of the pattern-blocks bears the same relation to the peripheries of rollers 91 that the bottom of the groove in wheel 85 bears to the periphery of the pattern-plate. It must be borne in mind that carrier 71 reciprocates on the bed as controlled by the pattern-plate and the weight, but that the pattern-blocks and wheel 85 are not attached to the carrier and have movements independent of the carrier in order that the cutter may be caused to trace any desired form of oval and also to adapt the machine to trim hats having varying heights of curls at the sides, as will presently be fully explained.

The principle of operation of the pattern-blocks is as follows: For convenience I will term the straight faces 92 of the pattern-blocks and also certain portions of the irregular faces thereof a “neutral line,” meaning by that a line upon the pattern-blocks which when engaged by rollers 91 upon the carrier will not change the position of the carrier, and consequently of the cutter, which is carried thereby, relative to the pattern-plate, but will leave the movements of the carrier, and consequently the path traced by the cutter, to be controlled by the pattern-plate alone—that is, without modification by the pattern-blocks. Variations in the path traveled by the cutter, and consequently variations in the oval traced thereby, are produced by variations from what I have termed the “neutral” line on the irregular faces of the pattern-blocks. If it is desired to cut away more of the flange of a hat-brim at the sides, ends, or quarters than would be cut away were the path traced by the cutter controlled by the pattern-plate alone, pattern-blocks are used the portions of whose irregular faces corresponding with the por-

tions of the brim-flange to be removed project beyond the so-called “neutral” line, so that the weight while retaining wheel 85 in engagement with the pattern-plate will not move the carrier as far toward the left, as seen in Figs. 1 and 10, as it does wheel 85, for the reason that the portions of the pattern-blocks which are engaged by rollers 91 on the carrier project beyond the so-called “neutral” line. The effect of this action of the projections on the pattern-blocks is to place the cutter farther from the center of the hat-body that is being operated upon than it would be placed by the pattern-plate, and consequently to make a deeper cut in the flange of the brim—that is, to cut away more stock, leaving the flange narrower. If it is desired to have the brim-flanges wider at the sides, ends, or quarters than they would be cut were the path traced by the cutter controlled by the pattern-plate alone, pattern-blocks are used in which the portions of the irregular faces corresponding with the portions of the brim-flange to be modified are cut away and depressed below the so-called “neutral” line, so that the weight will not only retain wheel 85 in engagement with the pattern-plate, but will move the carrier still farther toward the left, as seen in Figs. 1 and 10, for the reason that the portions of the pattern-blocks which are engaged by rollers 91 on the carrier are depressed below the so-called “neutral” line. The effect of this action of the depressions in the pattern-blocks is to place the cutter nearer to the center of the hat-body that is being operated upon than it would be placed by the pattern-plate, and consequently to make a shallower cut in the flange of the brim—that is, to cut away less stock, leaving the flange wider.

In Figs. 1, 10, and 13 I have illustrated pattern-blocks whose upper operative surfaces 94 project outward beyond the so-called “neutral” line, the central and lower operative surfaces corresponding with the neutral line. The action of this form of pattern-blocks is to cause the cutter to remove more of the brim-flange at the sides, thus narrowing the brim-flange at the sides, but leaving the path traced by the cutter at the ends and quarters of the brim to be controlled by the pattern-plate.

In Fig. 14 I have illustrated a form of pattern-block in which the upper operative surface 94<sup>a</sup> projects considerably beyond the so-called “neutral” line, the central operative surface 96<sup>a</sup> projects slightly beyond the so-called “neutral” line, and the lower operative surface 95<sup>a</sup> is depressed below the so-called “neutral” line, the effect of which would be, carrying out the principle of operation already described in full, to modify the action of the pattern-plate by cutting away considerably more of the brim-flange at the



sides, slightly more of the brim-flange at the quarters, and not as much of the brim-flange at the ends.

In Fig. 15 I have illustrated a form of pattern-block in which the upper operative surface 94<sup>b</sup> is depressed below the so-called "neutral" line, the central operative surface 96<sup>b</sup> corresponds with the so-called "neutral" line, and the lower operative surface 95<sup>b</sup> projects beyond the so-called "neutral" line, the effect of which would be to modify the action of the pattern-plate by cutting away less of the brim-flange at the sides and more of the brim-flange at the ends without modification of the action of the pattern-plate at the quarters.

In Fig. 16 I have illustrated a form of pattern-block in which the upper operative surface 94<sup>c</sup> and central operative surface 96<sup>c</sup> correspond with the so-called "neutral" line and the lower operative surface 95<sup>c</sup> projects beyond the so-called "neutral" line, the effect of which would be to modify the action of the pattern-plate by cutting away more of the brim-flange at the ends without modification of the action of the brim-flange at the sides and quarters.

It is of course well understood that in addition to variation in the ovals of hat-brim flanges there is great variation in the height of the curl at the sides of the brims in different styles of hats.

In order to adapt the machine to trim hat-brims with high curls at the sides, I provide mechanism for raising the cutter at the sides of the brim and depressing it again at the ends, which I will now describe. It will be apparent from the drawings that the pattern-plate, and with it of course wheel 85, through the engagement of the pattern-plate with the groove therein, will rise and fall as rollers 27 pass over the high and low portions of track-plate 28. This movement raises the hat-holder while the ends of the brim of a hat-body thereon are being operated upon, as in Fig. 1, and lowers the hat-holder and the body thereon while the sides of the brim are being operated upon, as in Fig. 10, the cutter remaining stationary relatively to the carrier, but of course reciprocating with the carrier, as already explained. I thus provide for trimming hat-brims having what may be termed an "ordinary" curl. If, however, the difference in the height of the brim at the ends and the sides is greater than the rise and fall of the hat-holder produced by the high and low portions of the track-plate, then the necessary additional rise of the cutter at the sides is produced through adjustment of the cutter-lifting rod, so that it will be engaged by wheel 85 when the latter moves downward.

102 denotes a rod which I term the "cutter-lifting" rod and which is adapted to reciprocate vertically in guides 103 on a bracket 104, which is itself rigidly secured to the carrier. At the upper end of rod 102 is an arm

105, having a slot 106. At the rear end of lever 77, which carries yoke 76 engaging the cutter-shaft, is a slot 107, which crosses the slot in the arm, a bolt 108 passing through said slots and loosely connecting the arm and the lever together, so that vertical movement of the rod and the arm will oscillate the lever on its fulcrum and raise and lower the cutter-shaft and cutter, as indicated by dotted lines in Fig. 1, as when trimming a hat-brim with high curls at the sides. At the lower end of the cutter-lifting rod (see Fig. 17) is an arm 109, which is adjustably connected to a corresponding arm 110 by means of a plate 111, having a slot 112, and bolts 113, which pass through the slot and engage the arms. Arm 110 carries a roller 114, which is adapted to engage the under side of wheel 85, said wheel lying in the opening 156 between said arms, as will be understood from Figs. 2 and 11. Cutter-lifting rod 102 and arm 105 are normally held at the raised position by means of a spring 146, bearing against the lower guide 103 and against a collar 147 on the rod, said spring through the slotted pivotal connection of lever 77 with arm 105 acting to retain the cutter-shaft and cutter at the lowered position, as in full lines in Fig. 1 and in Fig. 10. When it is required to trim hat-brims having a greater difference in height at the ends and sides than the normal rise and fall of the hat-holder produced by the track-plate, the operator loosens the lower bolt 113 and moves arm 110, carrying roller 114 upward far enough (then locking it in place by tightening up the bolt) so that said roller will be engaged by wheel 85 during its downward movement and moved downward thereby against the power of spring 146. The effect of this downward movement of rod 102 is indicated by dotted lines in Fig. 1, the forward end of lever 77 being shown as tilted upward, thereby raising the cutter-shaft and cutter. As soon as wheel 85 moves upward again spring 146 will return rod 102, lever 77, and the cutter-shaft and cutter to their normal position.

The upper side of arm 109 is engaged by an arm 115, rigidly secured to a vertical rod 116, which is adapted to reciprocate in guides 117, which are rigidly secured to and extend outward from the carrier. Rod 116 is provided with an enlargement 118, having a hole through which a rod 119 passes. Rod 119 extends outward at right angles from a lever 120, which is fulcrumed on a bracket 121, rigidly secured to and extending outward from the bed. The outer end of lever 120 is connected, by means of a link 122, with the outer end of operating-lever 36, as clearly shown in Fig. 2, which see in connection with Figs. 1, 10, and 11.

123 denotes an arm extending from the lower end of vertical rod 116. A chain or cord 124 extends from this arm and is connected to a



rest 125, pivoted to a bracket 126, which extends upward from the bed. (See Figs. 1 and 10.) A spring 127, secured to the bracket, engages the under side of the rest and normally raises it to its operative or locking position, as in Fig. 10.

128 denotes a lever pivoted to a bracket 129, extending upward from the bed, which is adapted to be engaged by the rest and locked in its operative position, as in Fig. 10, as will presently be more fully described. Cutter-bracket 70 is adjustably secured to a yoke 130 at the forward end of a slide 131, which is adapted to reciprocate in an opening 132 in the carrier and is provided on its under side with a rack 133. The cutter-bracket may be locked to the yoke after adjustment in any convenient manner, as by a set-screw 134 passing through the yoke and through a rearward extension of the bracket.

135 denotes a shaft journaled in the side plates 89 on the carrier and in a sleeve 136, extending outward therefrom, (see Fig. 11,) said shaft carrying a pinion 137, which engages the rack, and an arm 138, which extends downward into position to be engaged by lever 128 when said lever is in its operative position, as in Fig. 10.

140 denotes a rod adapted to move longitudinally in guides 141, which are rigidly secured to and extend upward from the bed. A spring 142, (see Fig. 3,) which bears against one of the guides and against a collar 143 on the rod, acts to retain said rod at the extreme of its movement toward the left, as it appears in Figs. 1 and 10.

144 (see Fig. 10) denotes a lug carried by an arm 145, rigidly secured to and depending from pattern-plate 24, which is adapted to engage rod 140 at the completion of the first revolution of shaft 23, the pattern-plate, and the hat-holder and project said rod toward the right against the power of the spring, the effect of which is to swing lever 128 from its normal or inoperative position, as in Fig. 1, outward to the position shown in Fig. 10. As soon as the lug has passed the rod spring 142 returns the rod to its normal position. The instant lever 128 swings outward, however, spring 127 acts to throw rest 125 upward past the lower end of lever 128 and lock said lever in its operative position, as in Fig. 10, in which position it is engaged by arm 138 an instant later—that is, at the conclusion of the first revolution of shaft 23, the pattern-plate, and hat-holder—the effect of which is to impart slight rotary movement to shaft 135 and the pinion and to move the rack, cutter-bracket, and cutter slightly toward the right, as seen in Figs. 1 and 10, the purpose of which will presently be fully explained. Lever 128 and the rest remain in the position shown in Fig. 10 until the completion of the second revolution of shaft 23 and the hat-

holder, when the machine is automatically stopped by the tripping of the operating-lever in the manner already fully described. When the operating-lever is tripped, the rear end thereof is raised by spring 45, the effect of which is by means of link 122, lever 120, and rod 119 to lower rod 116, carrying arm 123, drawing the latter downward, and by means of chain or cord 124 drawing down the rest against the power of spring 127. The normal or lowered position of the rest is clearly shown in Fig. 1. It is sufficient to say that lever 128 is made heaviest at its lower end or is pivoted above its mid-length, so that it will drop to its normal or inoperative position by gravity, and that the rest is drawn down far enough to permit the lever to pass it—that is, when the rest is drawn down the lever is left free to return by gravity to its normal position, as in Fig. 1.

I have already described at length the mechanism by which the path traveled by the cutter in use is determined, also means for modifying the path traveled by the cutter in order to produce a deeper or shallower cut at the ends, sides, and quarters of the brim, thereby leaving the flange of the trimmed brim wider or narrower, as may be required, and also means for raising the cutter at the sides of brims with high curls. In addition to these adjustments, however, it is desirable to provide means for adjusting the cutter toward or from the carrier and locking it in position after adjustment to adapt the machine to trim the brims of different sizes of hats of the same style or to make slight changes in the position of the cutter relative to the carrier, should it be required for any purpose whatever, without changing the pattern-blocks. This adjustment is effected by means of a hand-lever 148, pivoted to a bracket 149, which is rigidly secured to and extends outward from the carrier.

150 denotes a stud having a shoulder 157. This stud rigidly engages and extends upward from the slide through a slot 152 in the top plate 153 of the carrier. The hand-lever rests upon shoulder 157 and is provided with a slot 151, through which the reduced upper end of the stud passes. The hand-lever is locked to the stud by means of a nut 158, which engages the upper end of the stud and clamps the hand-lever between itself and the shoulder. To adjust the slide relatively to the carrier, the operator loosens nut 158 and moves the slide by means of the hand-lever toward or from the hat-holder, as may be required, to correspond with changes in the size of hat-bodies that are being operated upon. This slight movement of the slide will, through the rack and pinion 137, make the slight change necessary in the position of arm 138. In practice I provide a scale 154, graduated to correspond with different sizes of



hats, the edge of the hand-lever coacting with the proper graduation-mark in the scale to place the cutter in position to trim a hat-brim of the corresponding size.

5 The operation of cutter-lifting rod 102 and the several parts intermediate the cutter-lifting rod and operating-lever 36 and the various parts coacting therewith by which the position of the cutter is automatically shifted  
10 to make the finishing cut at the completion of the first revolution of shaft 23, the pattern-plate, and the hat-holder, and the machine is stopped and the cutter withdrawn from the operative position at the completion of the second  
15 revolution of shaft 23, the pattern-plate, and the hat-holder is as follows: The starting position is at one end of the brim, as in Fig. 1, the normal or inoperative position of the cutter being a raised position corresponding with  
20 the dotted position of belt-pulley 74 on the cutter-shaft in Fig. 1, spring 146 being compressed, and the normal or inoperative position of foot-lever 44 being the dotted position, as shown in Fig. 1. Having placed a hat-holder  
25 with a hat-body thereon in position upon shaft 23, the operator presses down upon the foot-lever, the effect of which is, through link 122, lever 120, rod 119, rod 116, and arm 115, which engages arm 109 upon the cutter-lifting rod,  
30 to raise arm 115 from the dotted to the full line position in Fig. 1 and permit spring 146 to raise the cutter-lifting rod and arm 105 from the normal or inoperative position (indicated by dotted lines in Fig. 1) to the operative or  
35 full-line position in said figure and by means of lever 77 to move the cutter-shaft and cutter downward into operative position. It will be noted that this movement of the cutter-lifting rod, lever 77, the cutter-shaft, and cutter  
40 corresponds substantially with the movement of said parts produced by wheel 85 in trimming brims with high curls. The movement is produced in an entirely different manner, however, and at a different time. This starting  
45 movement of operating-lever 36 also disengages pin 40 from the socket in gear-wheel 31 and places the members of clutch 34 in engagement, which starts the operative parts of the machine. The manner in which the operating-lever is locked in the operative position and is tripped at the end of the second  
50 revolution of the gear-wheel, shaft 23, and the hat-holder to stop the machine has already been fully described and is clearly illustrated in Figs. 4, 8, and 9. When this starting movement takes place and arm 123 moves from the dotted to the full line position in Fig. 1, cord or chain 124, which extends from said arm to rest 125, is of course left lying  
60 loose—that is, not taut. The position to which the cutter is moved by what I have termed the “starting” movement is a position in which it makes what may be termed a “roughing” cut—that is, it makes as deep a

cut into the edge of the brim-flange of a hat- 65  
body as may be necessary to remove all the stock to be removed except a thin strip entirely around, which is left to be removed by the cutter during the second rotation of shaft 23 and the hat-holder, during which second 70  
rotation of the hat-holder the cutter makes what may be termed a “finishing” cut. At the completion of the first revolution of shaft 23 and the hat-holder rod 140 is engaged by lug 144, which is carried by the shaft and 75  
projected toward the right against lever 128 with sufficient force to kick said lever outward, as shown in Fig. 10, in which position it is locked and chain or cord 124 tightened, as shown in Fig. 1, by spring-actuated rest 80  
125, as already fully described. An instant later and while lever 128 is in the position shown in Fig. 10 it is engaged by lever 138, due to the movement of the carrier to the right, the effect of which is to slightly rotate the pinion, owing to contact of lever 138 85  
with the lever 128 while the carrier is moving. Consequently through the engagement of the pinion with the rack a slight movement is imparted to slide 131 toward the right 90  
or in a direction from the hat, the movement of the slide of course moving the cutter farther toward the right and causing it to make the second or finishing cut on the edge of the hat-brim during the second rotation of 95  
shaft 23 and the hat-holder. At the completion of the second rotation of the hat-holder the tripping mechanism, already described in full and illustrated in Figs. 4, 8, and 9, operates and moves operating-lever 36 and the 100  
foot-lever from the dotted to the full line position shown in Fig. 1. This stopping movement of the operating-lever, through the connections already described in full, moves arm 123 downward from the full-line to the dotted 105  
position in Fig. 1, which, by means of chain or cord 124, draws rest 125 downward from the position shown in Fig. 10 to the position shown in Fig. 1 against the power of spring 127 and allows lever 128 to drop to its normal or inoperative position, as in Fig. 1, ready 110  
to be kicked outward again by rod 140 at the completion of the first revolution—that is, after the roughing-cut upon the next hat-body. Another result produced by the stopping movement of operating-lever 36, through 115  
the connections already described in full, is to draw down rod 116 and with it arm 115, which engages—i. e., rests upon—arm 109 upon cutter-lifting rod 102 and draw down 120  
the cutter-lifting rod against the power of spring 146, moving arm 105 from the full-line to the dotted position in Fig. 1, and by means of lever 77 moving the cutter-shaft and cutter from the full-line to the dotted position shown in said figure, thereby placing 125  
the cutter out of operative position again, so that the hat-holder, with the trimmed hat-body



thereon, may be removed and another hat-body upon a hat-holder attached to shaft 23 in position to be operated upon.

Having thus described my invention, I claim—

1. In a machine of the character described the combination with a shaft, a hat-holder and a pattern-plate carried thereby and means for imparting rotary and reciprocatory motion to said shaft, of a rotating cutter, a carrier on which the cutter is mounted and means intermediate the carrier and the pattern-plate for imparting reciprocatory movement to the carrier.

2. In a machine of the character described the combination with a hat-holder and pattern-plate and means for imparting uniform rotary and reciprocatory motion thereto, of a rotating cutter, a carrier on which the cutter is mounted, and means intermediate the carrier and the pattern-plate for imparting reciprocatory movement to the carrier.

3. In a machine of the character described the combination with a hat-holder and pattern-plate and means for imparting uniform rotary and reciprocatory movement thereto, of a rotating cutter, a carrier on which the cutter is mounted, a grooved wheel also mounted on the carrier which is engaged by the pattern-plate and means for retaining said wheel in engagement with the pattern-plate.

4. In a machine of the character described the combination with a hat-holder and pattern-plate and means for imparting uniform rotary and reciprocatory movement thereto, of a rotating cutter, a carrier on which the cutter is mounted, a grooved wheel also mounted on the carrier which is engaged by the pattern-plate, means for retaining said wheel in engagement with the pattern-plate and means for stopping the rotation of the hat-holder and pattern-plate at the end of the second revolution.

5. In a machine of the character described the combination with a shaft and a hat-holder and a pattern-plate provided with rollers carried by said shaft, of a track-plate engaged by the rollers and whose operative surface comprises two opposite high portions and two intermediate low portions, a rotating cutter, a carrier on which the cutter is mounted and means intermediate the carrier and the pattern-plate for imparting reciprocatory movement to the carrier.

6. In a machine of the character described the combination with a hat-holder and pattern-plate and means for imparting uniform rotary and reciprocatory motion thereto, of a rotating cutter, a carrier on which the cutter is mounted and which is provided with rollers 91, a grooved wheel engaged by the pattern-plate, a shaft 87 on which said wheel is mounted to rotate and pattern-blocks also carried by said shaft which are engaged by the rollers.

7. In a machine of the character described the combination with a hat-holder and pattern-plate and means for imparting uniform rotary and reciprocatory motion thereto, of a rotating cutter, a carrier on which the cutter is mounted and which is provided with rollers 91, a grooved wheel engaged by the pattern-plate, a shaft 87 on which said wheel is mounted to rotate, pattern-blocks also carried by said shaft, each comprising a straight face and an irregular face adapted to be engaged by the rollers, and means for retaining the rollers in engagement with the pattern-blocks and the wheel in engagement with the pattern-plate.

8. A pattern-block 88 having a straight face and an irregular face comprising an upper operative portion, a lower operative portion and a central operative portion, substantially as shown, for the purpose specified.

9. A pattern-block 88 having an irregular face comprising upper, lower and central operative portions, substantially as shown, for the purpose specified.

10. In a machine of the character described the combination with a hat-holder, of a pattern-plate and a track-plate below said holder, a rotating cutter, means for rotating said cutter, a carrier on which the cutter is mounted, said carrier being located at one side of said holder, a grooved wheel mounted on the carrier and means for retaining said wheel in engagement with the pattern-plate whereby the cutter is caused to trim the ordinary oval of a hat-brim.

11. In a machine of the character described the combination with a hat-holder, of a pattern-plate and a track-plate below said holder, a rotating cutter, a carrier on which the cutter is mounted, said carrier being located at one side of said holder, a grooved wheel, a shaft on which said wheel is mounted to turn, pattern-blocks also carried by said shaft which are provided with upper, lower and central operative portions adapted to be engaged by the carrier and means for retaining the carrier in engagement with the pattern-block and the wheel in engagement with the pattern-plate, whereby the cutter may be caused to vary the ordinary oval of a hat-brim.

12. In a machine of the character described the combination with a hat-holder, of a pattern-plate and a track-plate below said holder, a rotating cutter, means for rotating said cutter, a carrier on which the cutter is mounted, said carrier being located at one side of said holder, a grooved wheel mounted on the carrier, means for retaining said wheel in engagement with the pattern-plate whereby the cutter is caused to trim the ordinary oval of a hat-brim and means for imparting vertical movement to the cutter whereby it is adapted to trim brims having a relatively high curl.

13. In a machine of the character described the combination with a hat-holder and a pat-



tern-plate and means for imparting uniform rotary and reciprocatory motion thereto, of a longitudinally-movable rotating cutter, a carrier upon which the cutter is mounted, a grooved wheel also carried by the carrier which engages the pattern-plate and connections intermediate the cutter and the grooved wheel whereby longitudinal movement is imparted to the cutter.

14. In a machine of the character described the combination with a rotary cutter, a shaft by which it is carried and a reciprocating carrier on which the shaft is mounted, of driving mechanism, a foot-lever and intermediate connections whereby the driving mechanism is controlled and connections intermediate the foot-lever and the cutter-shaft whereby the cutter is thrown into and out of operative position simultaneously with the starting and stopping of the machine.

15. In a machine of the character described the combination with a rotary cutter, a shaft by which it is carried and a reciprocating carrier on which the shaft is mounted, of driving mechanism, a foot-lever and intermediate connections whereby the driving mechanism is controlled, cutter-lifting rod 102 and intermediate connections whereby longitudinal movement is imparted to the cutter-shaft, a spring for lifting rod 102 and throwing the cutter into operative position, and connections intermediate the cutter-lifting rod and the foot-lever whereby rod 102 is drawn down against the power of the spring and the cutter is thrown out of operative position.

16. In a machine of the character described the combination with a hat-holder and a pattern-plate, means for imparting uniform rotary and reciprocatory motion thereto, a rotary cutter, a shaft by which it is carried, a reciprocating carrier on which the shaft is mounted and a grooved wheel mounted on the carrier and engaging the pattern-plate, of cutter-lifting rod 102, connections intermediate said rod and the cutter-shaft whereby longitudinal movement is imparted to said shaft and an adjustable arm 110 carried by the cutter-lifting rod which is adapted to be placed in position to be engaged by the grooved wheel to lower the cutter-lifting rod and raise the cutter in trimming brims with a high curl.

17. In a machine of the character described the combination with a hat-holder and a pattern-plate, means for imparting uniform rotary and reciprocatory motion thereto, a rotary cutter, a shaft by which it is carried, a reciprocating carrier on which the shaft is mounted and a grooved wheel mounted on the carrier and engaging the pattern-plate, of cutter-lifting rod 102, connections intermediate said rod and the cutter-shaft whereby longitudinal movement is imparted to said shaft, driving mechanism, a foot-lever and intermediate connections for controlling the driving mechanism, vertical rod 116, connections in-

intermediate said rod and the foot-lever, an arm 115 extending from rod 116 and arms 109 and 110 connected to the cutter-lifting rod which are adapted to be engaged respectively by arm 115 and the grooved wheel, substantially as shown, for the purpose specified.

18. In a machine of the character described the combination with a reciprocating carrier, wheel 85 mounted on said carrier and a rotating cutter and a longitudinally-movable shaft therefor also mounted on the carrier, of a lever 77 having a yoke engaging the cutter-shaft and a slot 107, cutter-lifting rod 102 having an adjustable arm 110 adapted to engage wheel 85 and an arm 105 having a slot 106 which intersects the slot in lever 77 and a bolt engaging said slots at the intersection, whereby vertical movement may be imparted to the cutter-shaft and cutter.

19. In a machine of the character described the combination with a hat-holder, a vertically-movable shaft 23 by which it is carried, driving-shaft 33, driving connections intermediate said shafts, a driving-pulley loose on shaft 33 and a clutch intermediate said pulley and the shaft, of an operating-lever, a pin depending therefrom for locking the parts in the stopping position, gravity locking-lever 47 for retaining the operating-lever in the starting position, a spring for throwing the operating-lever to the stopping position and means for tripping the locking-lever at a predetermined time.

20. In a machine of the character described the combination with shaft 23 carrying a gear-wheel having a socket 42, shaft 33 carrying a pinion engaging the gear-wheel and a driving-pulley and a clutch intermediate said shaft and the driving-pulley, of an operating-lever connected to one of the clutch members, a pin depending from said lever and adapted to engage the socket, a spring normally acting to retain the clutch members out of engagement and the pin in the locking position, a gravity locking-lever for retaining the operating-lever in the operative position and means for tripping the locking-lever so that the spring will actuate the operating-lever, separate the clutch members and place the pin in engagement with the socket at the end of the second rotation of the gear-wheel and shaft 23.

21. In a machine of the character described the combination with operating-lever 36, a spring for retaining said lever out of operative position and a gravity locking-lever for retaining it in operative position against the power of the spring, of means for tripping the locking-lever at predetermined times, substantially as shown, for the purpose specified.

22. In a machine of the character described the combination with shaft 23 carrying a gear-wheel having a socket 42 and a lug 65, driving mechanism, an operating-lever, a spring for retaining said lever out of operative position and a gravity locking-lever for retaining the



operating-lever in operative position against the power of the spring and which is provided with a pin 67, of a ratchet 52 which is engaged by lug 65 at the end of each rotation of the gear-wheel and is provided with a lug 59, a pawl for locking the ratchet against backward movement and a cord and weight for returning the ratchet to its normal position when released, said lug 59 acting when the ratchet is moved forward by lug 65 the second time to trip the locking-lever whereby the operating-lever is released and the pawl is engaged by pin 67 and caused to release the ratchet.

23. In a machine of the character described the combination with shaft 23, a clutch and driving mechanism, of mechanism intermediate said shaft and the driving mechanism whereby the clutch is disconnected and the shaft is stopped at the completion of the second rotation thereof.

24. In a machine of the character described the combination with a hat-holder and pattern-plate, means for imparting uniform rotary and reciprocatory movement thereto and a rotating cutter, of a carrier on which the cutter is mounted, a grooved wheel also mounted on the carrier which is engaged by the pattern-plate and means for shifting the position of the cutter at the end of the first rotation of the hat-holder so that a finishing cut is made during the second rotation.

25. In a machine of the character described the combination with a hat-holder and pattern-plate, means for imparting uniform rotary and reciprocatory movement thereto, and a rotating cutter, of a reciprocating carrier on which the cutter is mounted and which receives motion from the pattern-plate, means for shifting the position of the cutter at the end of the first rotation of the hat-holder so that a finishing cut is made during the second rotation and means for stopping the rotation of the hat-holder at the end of its second rotation.

26. In a machine of the character described the combination with a hat-holder and pattern-plate, a shaft by which they are carried and means for imparting rotary and reciprocatory movement to said shaft, of a rotating cutter, a bracket on which the cutter is journaled, a slide by which the bracket is carried, a reciprocating carrier on which the slide is mounted and which receives motion from the pattern-plate and mechanism intermediate the shaft and the slide whereby the cutter is moved backward at the end of the first rotation of the shaft so as to make a finishing cut during the second rotation.

27. In a machine of the character described the combination with a hat-holder and a pattern-plate, a shaft by which they are carried and means for imparting rotary and reciprocatory movement to said shaft, of a rotating cutter, a slide on which the cutter is journaled, a carrier on which the slide is mounted and

which receives motion from the pattern-plate, mechanism for moving the slide and cutter backward relatively to the carrier at the end of the first rotation of the shaft and means for stopping the shaft at the end of the second rotation.

28. In a machine of the character described the combination with a rotating hat-holder and pattern-plate and a lug 144 moving therewith, of a rotating cutter, a slide on which it is journaled and which is provided with a rack, a reciprocating carrier on which the slide is mounted and which receives motion from the pattern-plate, a shaft journaled in the carrier and carrying a pinion engaging the rack and an arm 138, a pivoted lever 128 adapted to be engaged by said arm and move the slide and cutter backward relatively to the carrier, a spring-controlled rod 140 adapted to be engaged by lug 144 to place the lever in operative position and means for locking said lever in operative position.

29. In a machine of the character described the combination with the carrier, slide 131 having a rack and a shaft journaled in the carrier and carrying a pinion engaging the slide and an arm 138, of a pivoted lever 128 adapted to be engaged by said arm to move the slide backward relatively to the carrier, a reciprocating rod 140 adapted to engage the lever to place it in operative position, a spring-controlled rest which locks the lever in operative position, an operating-lever and connections intermediate the operating-lever and the rest whereby the rest is caused to release the lever.

30. In a machine of the character described the combination with a hat-holder and pattern-plate and means for imparting rotary and reciprocatory movement thereto, of a reciprocating carrier which receives motion from the pattern-plate, a rotating cutter, a slide on which the cutter is journaled and which is mounted on the carrier and means for adjusting the slide relatively to the carrier whereby the position of the cutter is changed to adapt the machine to different sizes of hats of the same style.

31. In a machine of the character described the combination with a hat-holder and pattern-plate and means for imparting rotary and reciprocatory movement thereto, of a reciprocating carrier which receives motion from the pattern-plate, a rotating cutter, a slide on which the cutter is journaled and which is mounted on the carrier and means intermediate the slide and the pattern-plate for moving the carrier backward at the end of the first rotation of the pattern-plate, whereby the cutter is placed in position to make a finishing cut during the second rotation of the pattern-plate and hat-holder.

32. In a machine of the character described the combination with a hat-holder and pattern-plate and means for imparting rotary and reciprocatory movement thereto, of a reciprocating carrier which receives motion from the pattern-plate, a rotating cutter, a slide on which the cutter is journaled and which is mounted on the carrier and means for adjusting the slide relatively to the carrier whereby the position of the cutter is changed to adapt the machine to different sizes of hats of the same style.



reciprocating carrier which receives motion from the pattern-plate, a rotating cutter, a slide on which the cutter is journaled and which is mounted on the carrier, means intermediate the slide and the pattern-plate for moving the carrier backward at the end of the first rotation of the pattern-plate to place the cutter in position to make a finishing cut during the second rotation and automatic mechanism for stopping the hat-holder and pattern-plate at the end of the second rotation.

33. In a machine of the character described the combination with a rotating cutter and a reciprocating carrier on which it is journaled, of a hat-holder and pattern-plate, means for imparting rotary and reciprocatory movement thereto, and connections intermediate the pattern-plate and the carrier whereby reciprocatory movement is imparted to the carrier.

34. In a machine of the character described the combination with a rotating cutter, a reciprocating carrier on which it is journaled and a vertically-movable grooved wheel also journaled on the carrier, of a hat-holder, a pattern-plate engaging the grooved wheel, means for imparting rotary and reciprocatory movement to the hat-holder and pattern-plate and means, as a cord, and weight, for retaining the wheel in engagement with the pattern-plate.

35. In a machine of the character described the combination with a rotating cutter, a reciprocating carrier on which it is journaled, a vertically-movable grooved wheel also journaled on the carrier and pattern-blocks moving with the grooved wheel, of a hat-holder, a pattern-plate engaging the grooved wheel, means for imparting rotary and reciprocatory movement to the hat-holder and pattern-plate and means for retaining the grooved wheel in engagement with the pattern-plate and the carrier in engagement with the pattern-blocks, whereby the cutter may be caused to trace variations from the oval of the pattern-plate.

36. In a machine of the character described the combination with a rotating cutter, a reciprocating carrier on which it is journaled and a vertically-movable grooved wheel journaled on the carrier, of a hat-holder, a pattern-plate engaging the grooved wheel, means for imparting rotary and reciprocatory movement to the hat-holder and pattern-plate, means for retaining the wheel in engagement with the pattern-plate and connections intermediate the grooved wheel and the cutter whereby the cutter may be moved longitudinally to adapt the machine to high curls.

37. In a machine of the character described the combination with a rotating cutter, a reciprocating carrier on which it is journaled, a vertically-movable grooved wheel also journaled on the carrier and pattern-blocks moving with the grooved wheel, of a rotary and longitudinally-movable hat-holder and pat-

tern-plate, the latter engaging the grooved wheel, means for retaining said wheel in engagement with the pattern-plate and the carrier in engagement with the pattern-blocks, whereby the oval traced by the cutter may be varied, and connections intermediate the wheel and the cutter whereby the latter may be moved longitudinally in trimming high curls.

38. In a machine of the character described the combination with a rotating cutter and a reciprocating carrier on which it is journaled, of a hat-holder, a pattern-plate carrying rollers 27, a track-plate having two high portions and two intermediate low portions which are engaged by the rollers and means for imparting rotary movement to the hat-holder and pattern-plate.

39. In a machine of the character described the combination with a rotating cutter, and a reciprocating carrier on which the cutter is journaled, of a rotary and longitudinally-movable hat-holder and pattern-plate and connections intermediate the pattern-plate and the carrier which determine the movement of the latter.

40. In a machine of the character described the combination with a cutter, a longitudinally-movable shaft by which it is carried, a reciprocating carrier on which the shaft is journaled and a vertically-movable grooved wheel also journaled on the carrier, of a rotary and longitudinally-movable hat-holder and pattern-plate, said pattern-plate being engaged by the grooved wheel, cutter-lifting rod 102 carrying an arm adapted to be engaged by said wheel in its downward movement and connections intermediate said rod and the cutter-shaft whereby downward movement of the rod will raise the cutter-shaft substantially as and for the purpose set forth.

41. In a machine of the character described the combination with a cutter, a longitudinally-movable shaft by which it is carried and a reciprocating carrier on which the shaft is journaled, of cutter-lifting rod 102 carrying an arm 109, a spring acting to hold said rod in the raised position, connections intermediate said rod and the cutter-shaft whereby endwise movement of the rod imparts reverse endwise movement to the cutter-shaft, an operating-lever and connections terminating in an arm 115 which engages arm 109.

42. In a machine of the character described the combination with a cutter, a longitudinally-movable shaft by which it is carried, a reciprocating carrier on which the shaft is journaled and a vertically-movable grooved wheel also journaled on the carrier, of a vertically-movable hat-holder and pattern-plate the latter engaged by the grooved wheel, cutter-lifting rod 102 carrying an arm 109 and an arm 110 adapted to be engaged by the grooved wheel in its downward movement, a spring acting to hold said rod in the raised position, connections intermediate said rod



and the cutter-shaft whereby endwise movement of the rod imparts reverse endwise movement to the cutter-shaft, an operating-lever and connections terminating in an arm 115 which engages arm 109 to throw the cutter out of operative position when the stopping movement of the operating-lever takes place.

43. In a machine of the character described the combination with a rotating cutter, a reciprocating carrier on which it is journaled, a vertically-movable grooved wheel also journaled on the carrier and pattern-blocks moving with the grooved wheel, of a hat-holder, a pattern-plate engaging the grooved wheel, means for imparting rotary and reciprocatory movement to the hat-holder and pattern-plate and means for retaining the wheel in engagement with the pattern-plate and the carrier in engagement with the pattern-blocks.

44. In a machine of the character described the combination with a rotating cutter, a reciprocating carrier on which it is journaled and which is provided with rollers 91, a vertically-movable grooved wheel on the carrier and pattern-blocks moving with the grooved wheel, of a hat-holder, a pattern-plate carrying rollers 27, a track-plate having two high portions and two intermediate low portions which are engaged by rollers 27, means for imparting rotary movement to the hat-holder and pattern-plate and means for retaining the grooved wheel in engagement with the pattern-plate and rollers 91 in engagement with the pattern-blocks.

45. In a machine of the character described the combination with a longitudinally-mov-

able rotating cutter, a reciprocating carrier on which said cutter is journaled and which is provided with rollers 91, a vertically-movable grooved wheel on the carrier and pattern-blocks moving with the grooved wheel, of a rotary and longitudinally-movable hat-holder and pattern-plate, said grooved wheel engaging the pattern-plate and said rollers engaging the pattern-blocks, cutter-lifting rod carrying an arm adapted to be engaged by the grooved wheel in its downward movement and connections intermediate said rod and the cutter whereby downward movement of the rod will raise the cutter.

46. In a machine of the character described the combination with a longitudinally-movable rotating cutter, a reciprocating carrier on which it is journaled and which is provided with rollers 91, a vertically-movable grooved wheel on the carrier, pattern-blocks moving with the grooved wheel and engaged by the rollers and a rotating pattern-plate engaged by the grooved wheel, of cutter-lifting rod 102 carrying an arm 109, a spring acting to hold said rod in the raised position, connections intermediate said rod and the cutter whereby endwise movement of the rod imparts reverse endwise movement to the cutter, an operating-lever and connections terminating in an arm 115 which engages arm 109.

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

CHARLES I. STERLING.

Witnesses:

SPENCER S. ADAMS,  
CHARLES E. HOYT.