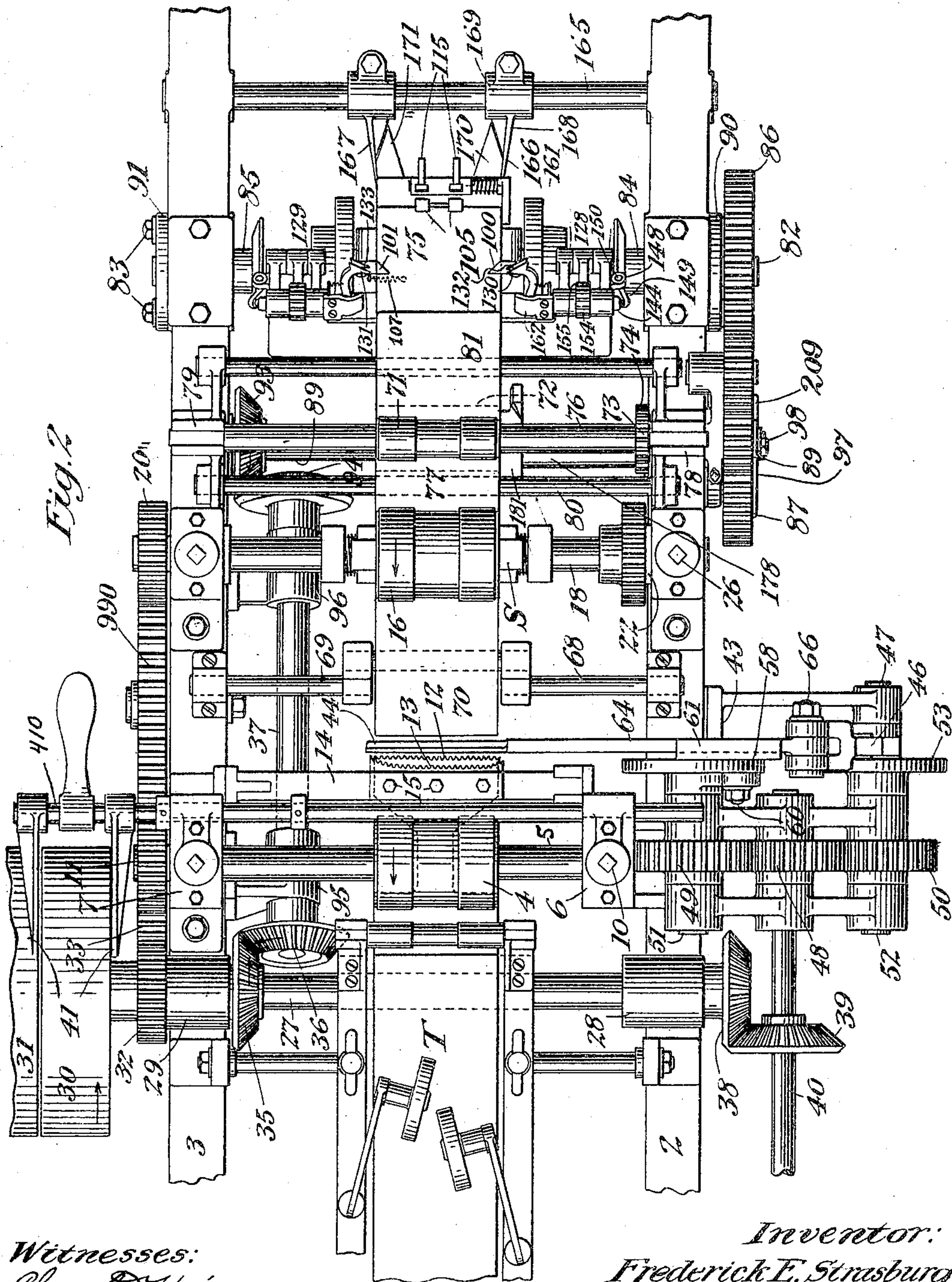


No. 812,378.

PATENTED FEB. 13, 1906.

F. E. STRASBURG.
PAPER BAG MACHINE.
APPLICATION FILED SEPT. 29, 1904

7 SHEETS—SHEET 2.



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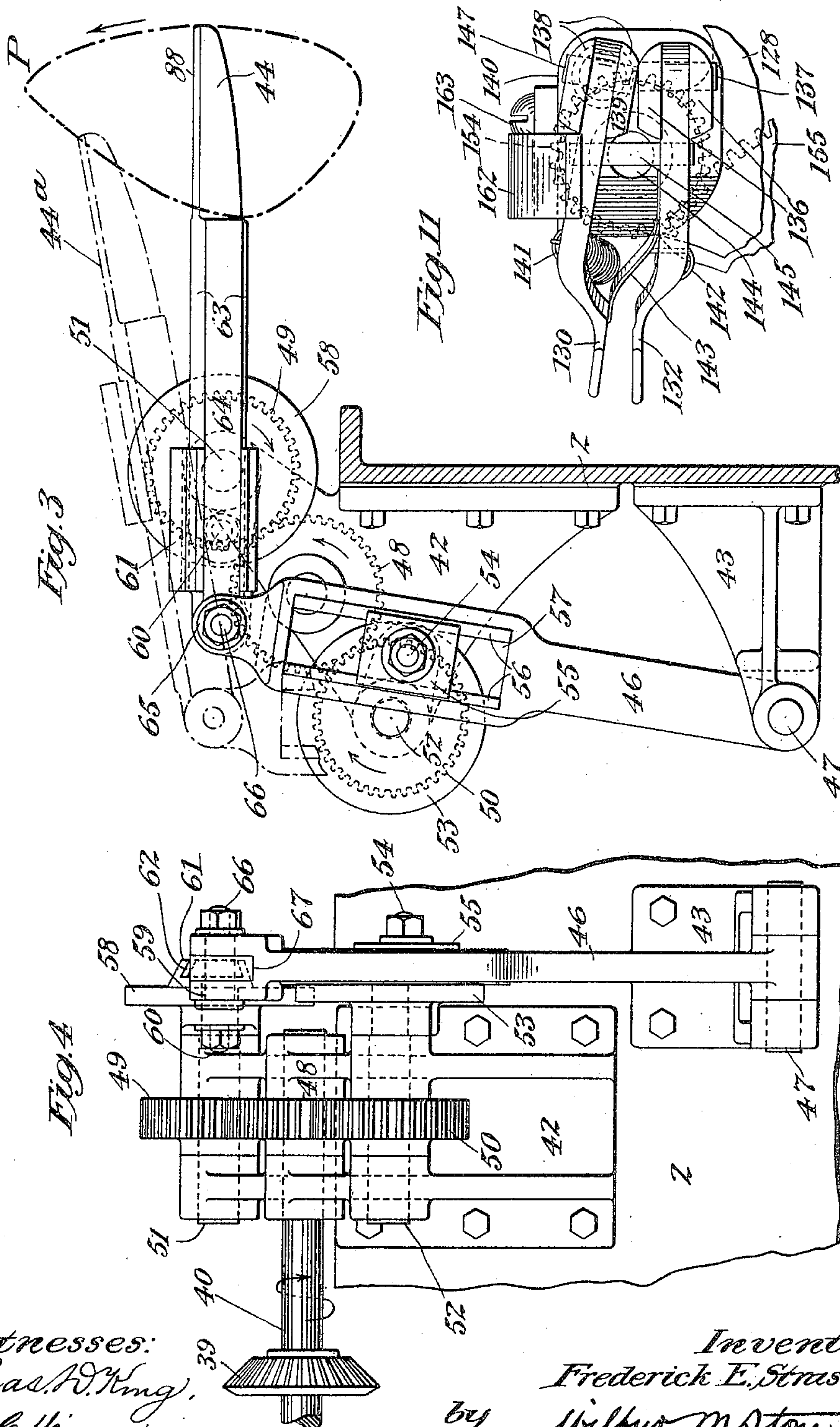
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7 SHEETS—SHEET 3.



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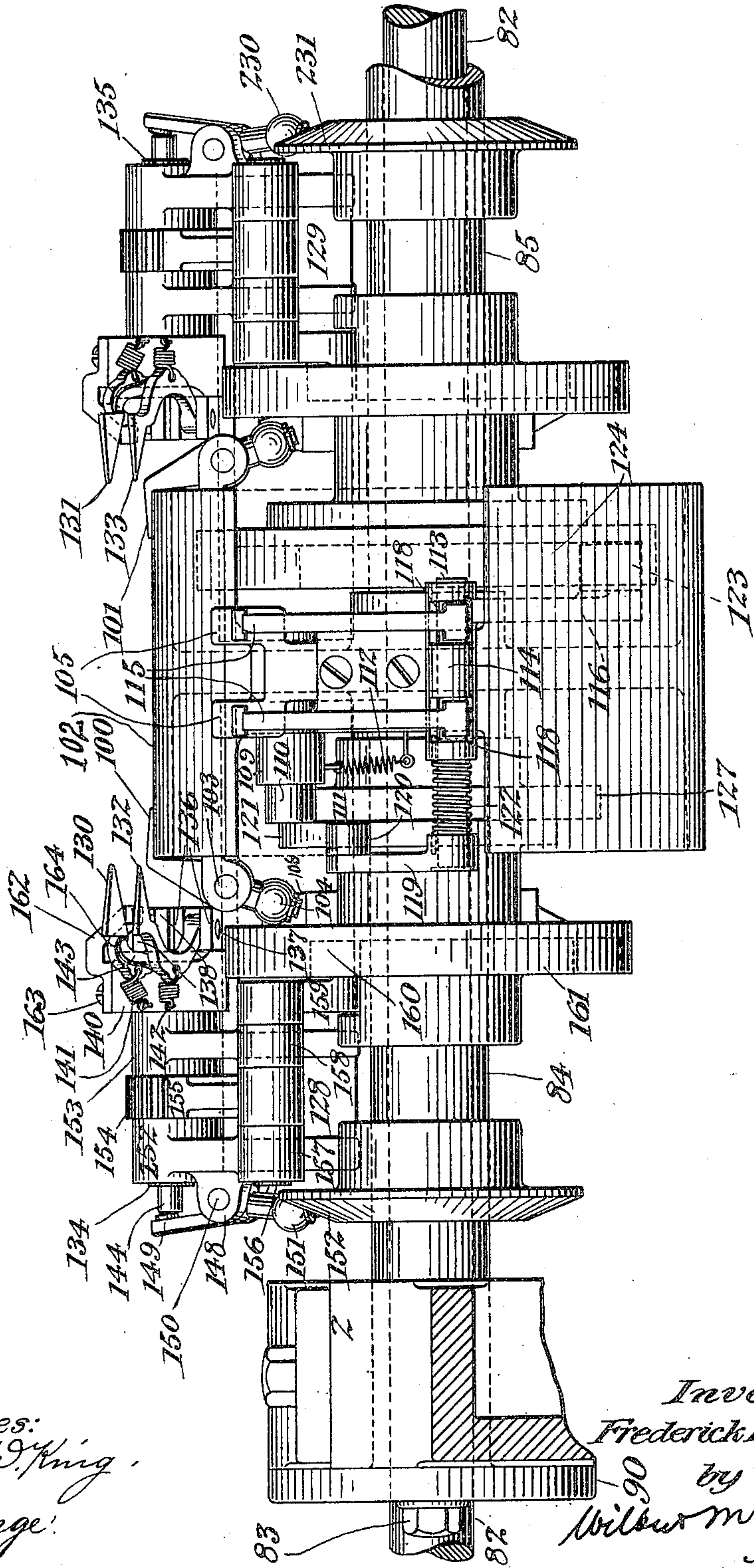
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7 SHEETS—SHEET 4.

Fig. 5



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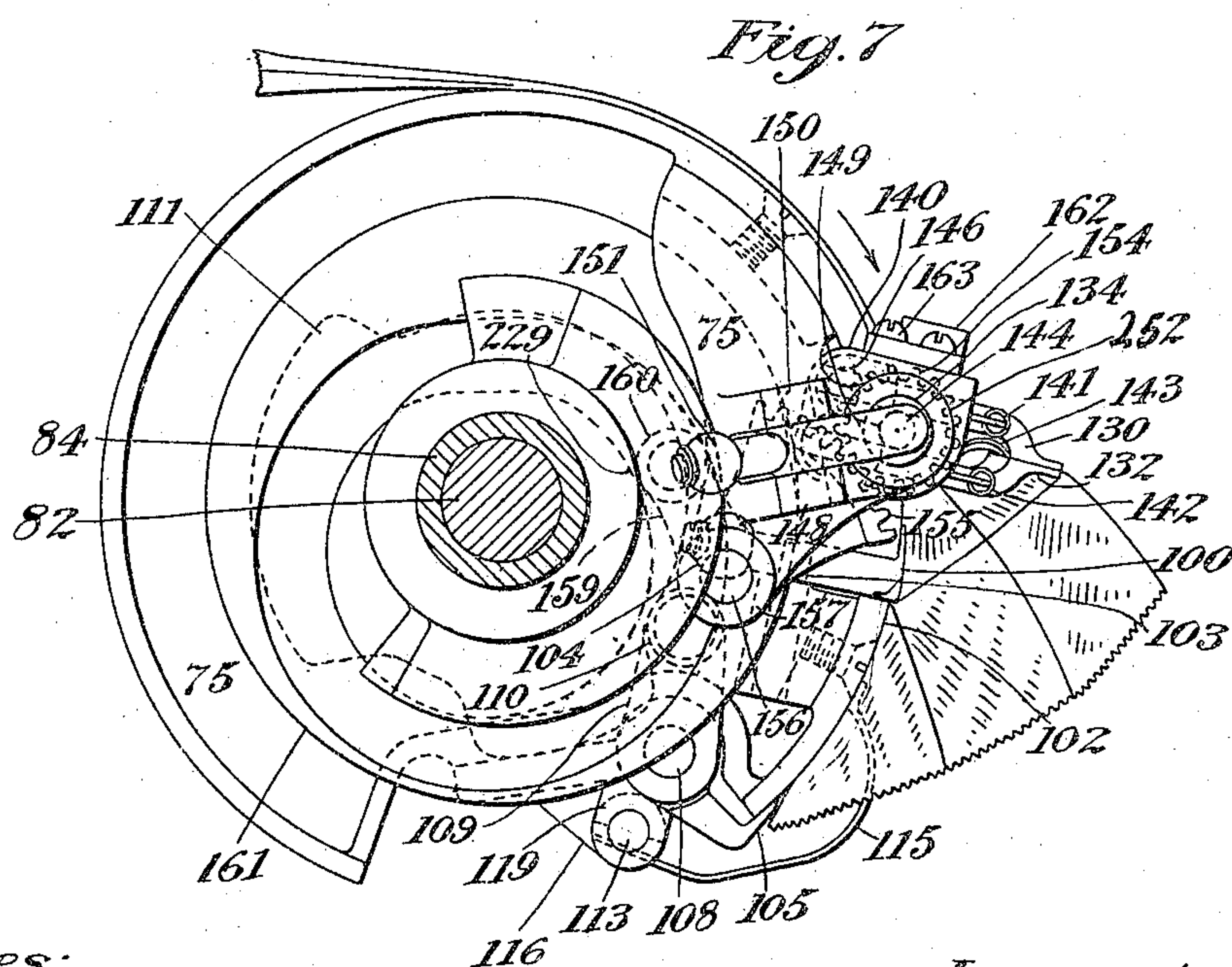
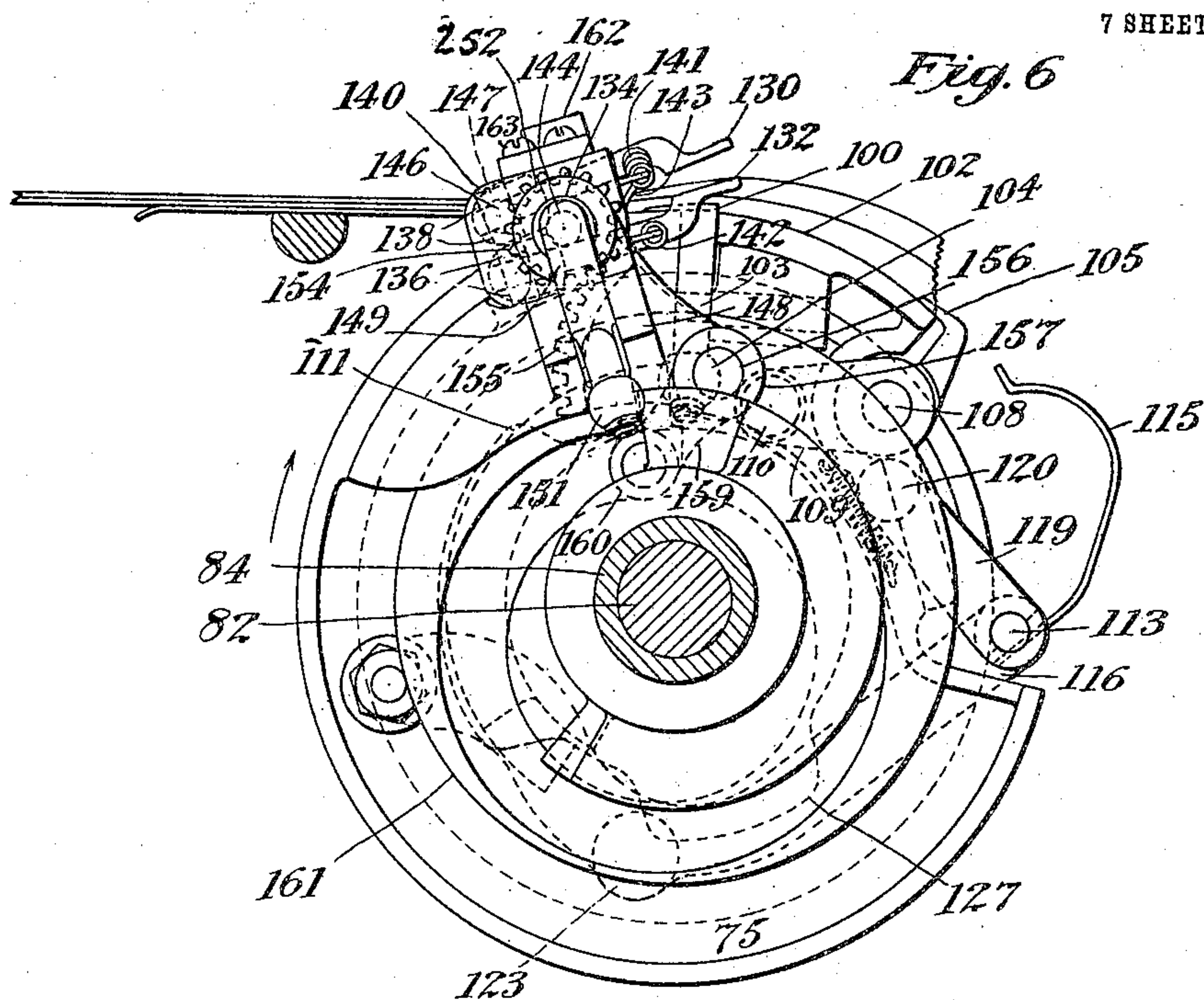
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7 SHEETS—SHEET 5.



Witnesses:
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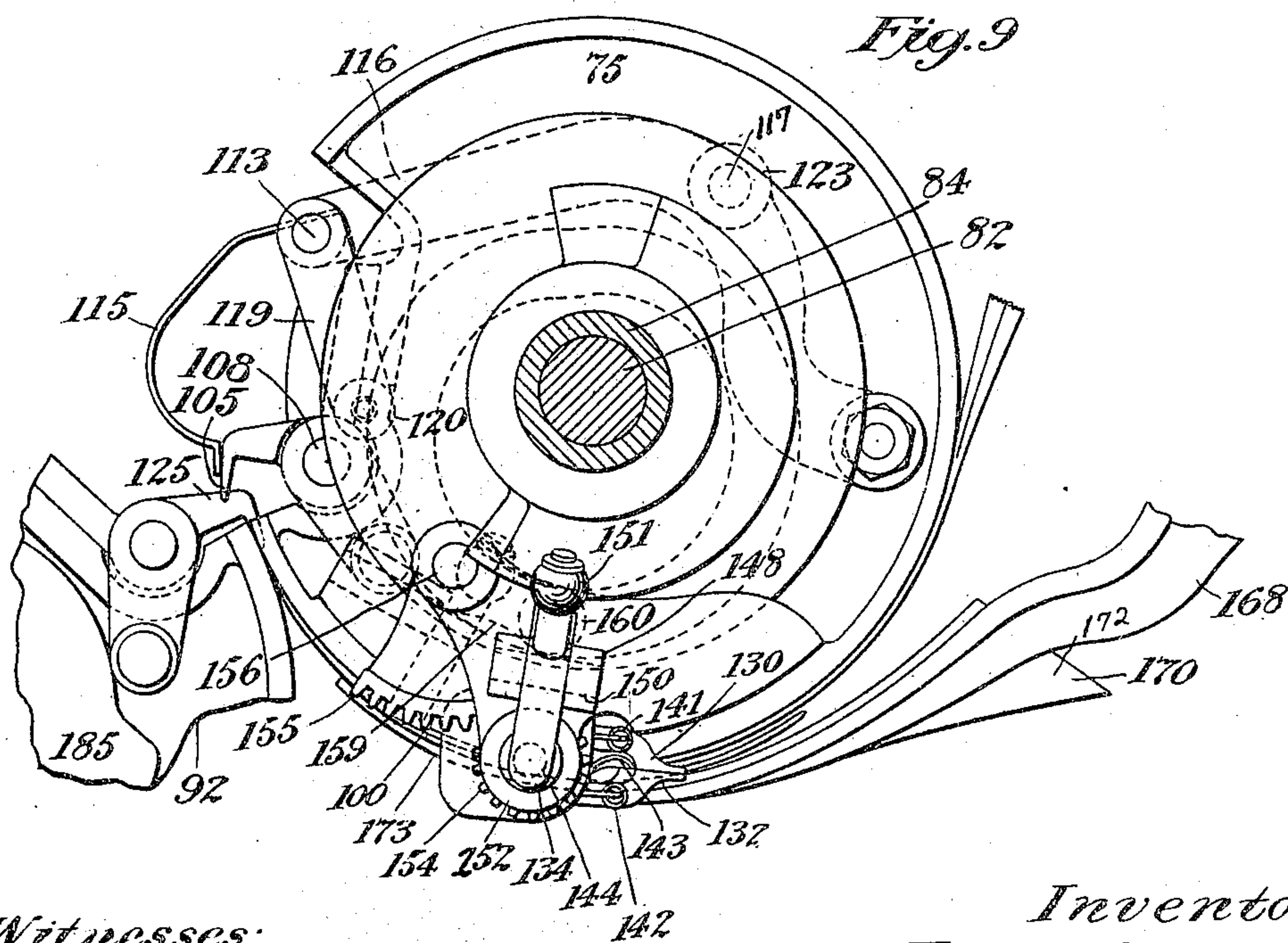
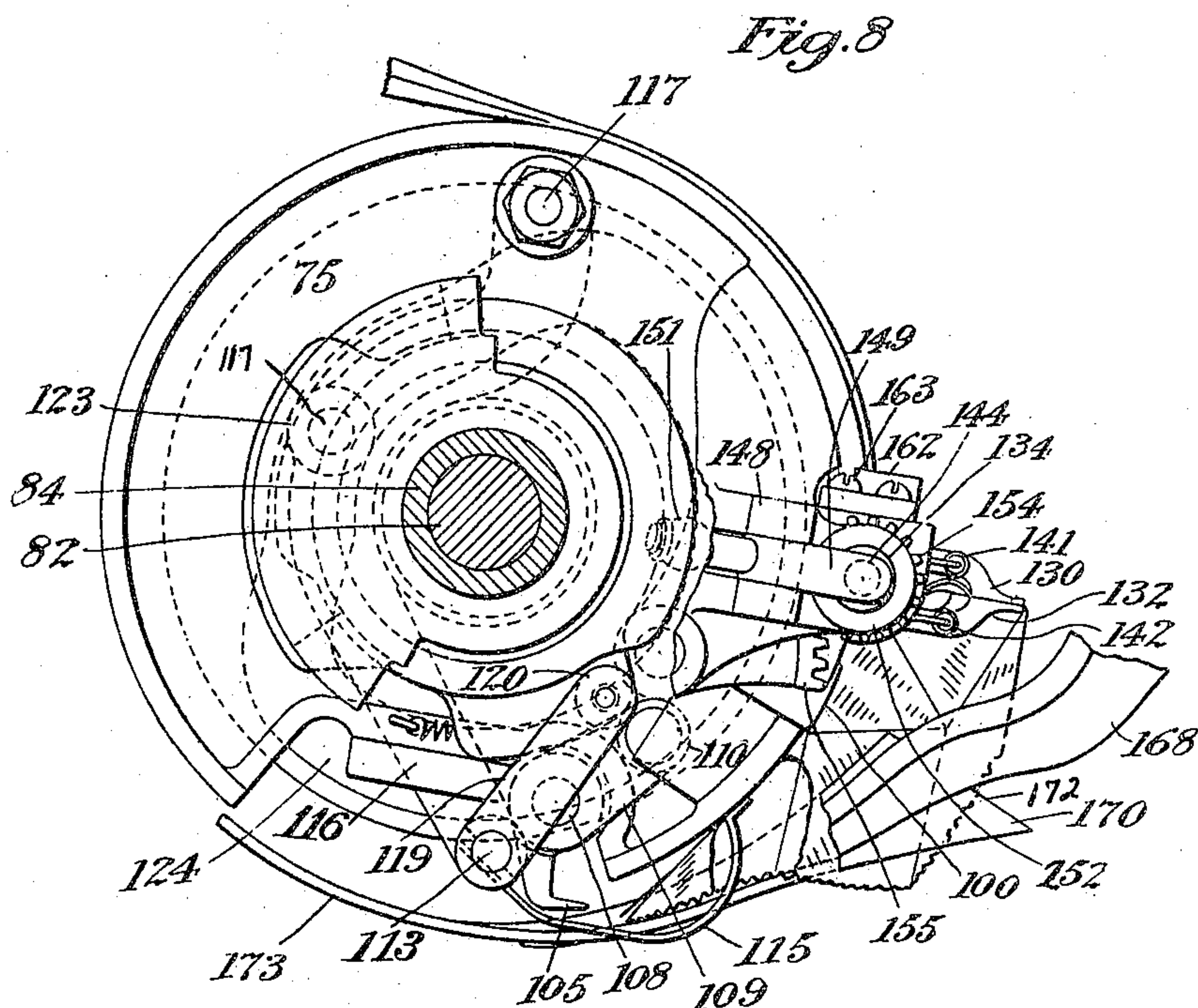
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APPLICATION FILED SEPT. 29, 1904.

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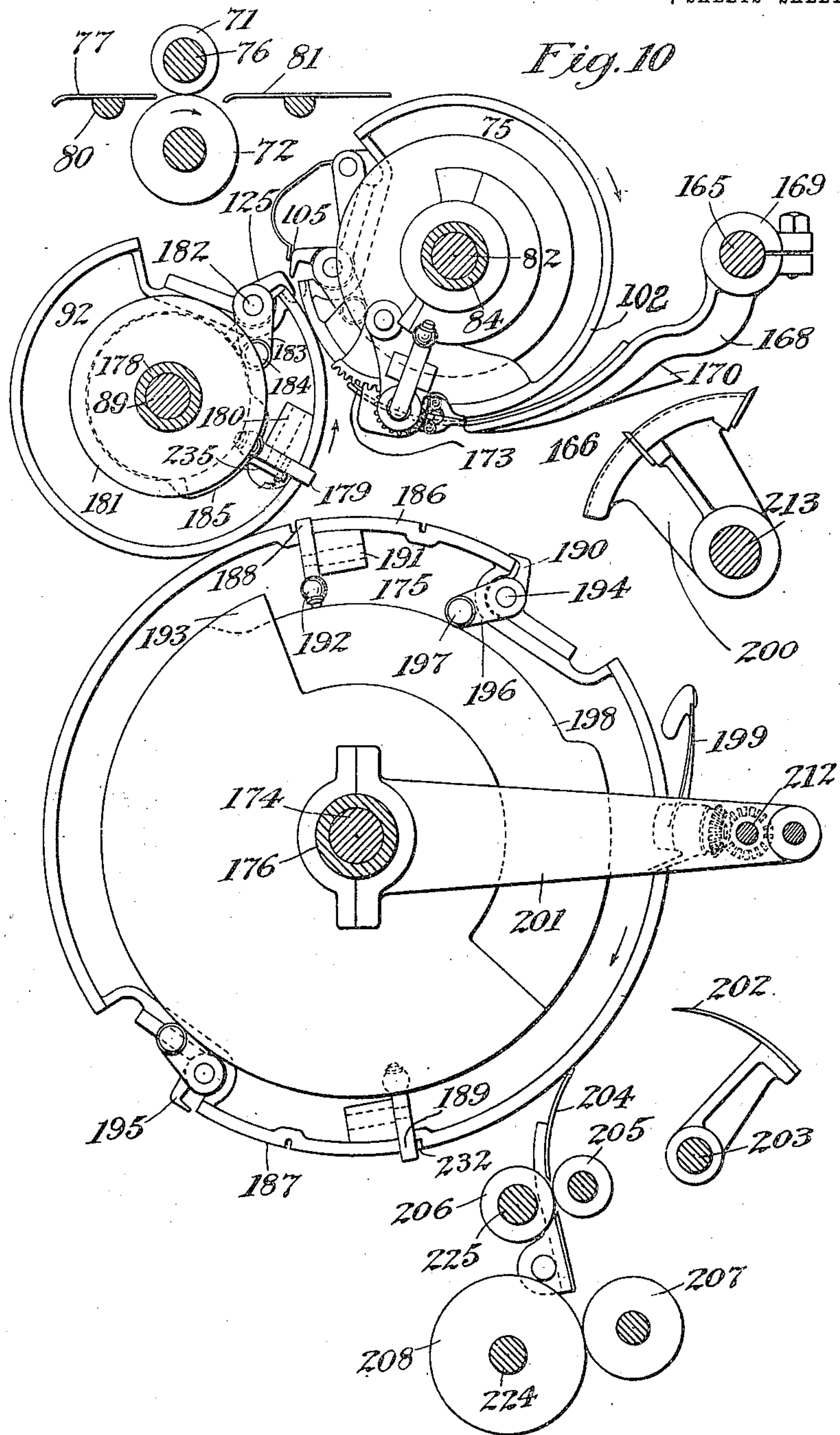
No. 812,378.

PATENTED FEB. 13, 1906.

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PAPER BAG MACHINE.

APPLICATION FILED SEPT. 29, 1904.

7 SHEETS—SHEET 7.



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UNITED STATES PATENT OFFICE.

FREDERICK E. STRASBURG, OF RUMFORD FALLS, MAINE, ASSIGNOR TO
CONTINENTAL PAPER BAG COMPANY, A CORPORATION OF MAINE.

PAPER-BAG MACHINE.

No. 812,378.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed September 29, 1904. Serial No 226,551.

To all whom it may concern:

Be it known that I, FREDERICK E. STRASBURG, a citizen of the United States, and a resident of Rumford Falls, in the county of Oxford and State of Maine, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification.

This invention relates to paper-bag machines, and more directly to that class of paper-bag machines in which the end of a paper tube having an inwardly - folded tuck in each side thereof is opened out and folded down into the well-known diamond form and in which the front and rear flaps of the folded diamond are later folded over to form the well-known square bottom of a paper bag.

In the drawings accompanying this specification is illustrated a paper-bag machine embodying one form of my improvements, and wherein—

Figure 1 is a side elevation thereof with the mechanism for forming the tucked - paper tubing and a part of the framing broken away. Fig. 2 is a plan view of the same. Fig. 3 is a front elevation of the tube-severing mechanism, and Fig. 4 is a side elevation of the same. Fig. 5 is a front elevation of the diamond-folding mechanism; and Figs. 6, 7, 8, and 9 are side elevations thereof, illustrating successive steps in the operation of said mechanism. Fig. 10 is a side elevation showing more in detail the mechanism for completing the bag after the diamond fold has been formed. Fig. 11 is a side elevation of one of the pairs of gripping-blades provided for turning over the upper ply of the bag-blank to form the diamond fold.

The paper-bag machine in which I have in the present instance chosen to embody my improvements may comprise side frames 2 3, herein illustrated as of skeleton construction and on which the various mechanisms and parts may be suitably arranged and secured. The delivery end of some suitable tucked-paper-tube mechanism is indicated in a general way by T, and as such mechanism is no part of my invention it will be unnecessary to refer to it more in detail. Directly succeeding said delivery end is a pair of feed-rolls, as 4. Said rolls are mounted upon shafts, as 5, supported in suitable bearings 6 7 in side frames 2 3, respectively. The bearings for the upper of said shafts 5 may be

supported in slidable boxes, as 8, and which boxes may be mounted in upwardly-extending portions, as 24, of the respective side frames. Said boxes may be urged downwardly by means of springs, as 9, and the tension of which springs may be adjusted by means of screws, as 10. Rolls 4 may be caused to run in rolling contact by means of gears, as 11, on their respective shafts. Extending forwardly through a space formed by circumferential depressions in said feed-rolls is float 12, having the usual serrated front edge. Above said float and secured to a cross-beam 14 by means of screws, as 15, is blade 13, also provided with the usual serrated front edge. Somewhat in advance of rolls 4 is a second pair of feed-rolls 16 17, mounted upon shafts 18 19, respectively, and which shafts may be geared together by means of gears 20 21, respectively. Shafts 18 19 may be mounted for rotation in frames 2 3. I prefer to support upper shaft 18 in slidable boxes, as 22, and which boxes are mounted in upwardly-extending portions, as 23, of the respective side frames. Said boxes, as 22, may be urged downwardly to cause rolls 16 17 to coact by means of springs, as 25, and the tension of which springs may be adjusted by means of screws, as 26.

The driving mechanism of the machine is as follows: Mounted in suitable boxes 28 29, supported on side frames 23, respectively, is main shaft 27. On the rearward end of said shaft are mounted the usual tight and loose pulleys 30 31, respectively; also several gears are mounted upon said shaft—to wit, spur-gear 32, gearing through intermediate gear 33 into lower gear 11 of driving-rolls 4 and from gear 11 through large intermediate gear 99 into lower feed-roll gear 21; bevel-gear 35, meshing with bevel-gear 36 on intermediate shaft 37, which shaft is mounted in suitable bearings 95 96, extending inwardly from frame 3 and which transmits power to the various mechanisms at the forward part of the machine, and bevel-gear 38, meshing with bevel-gear 39 on shaft 40 for driving the severing mechanism. Power may be communicated to the machine by suitable means, such as a hand-wheel 45 or a belt engaging pulley 30. By means of the usual shipper-fingers 41 on reciprocating shipper-rod 410 said belt may be shifted to and from said pulley. Intermediate the two pairs of feed-rolls 4 4 and

16 17, respectively, and contiguous to the serrated edges of blade 13 and float 12 is mounted striker 44 for severing; in connection with said blade and float, the tucked-
 5 paper tube into bag-blanks. Striker 44 and its operating mechanism may be best understood by reference to Figs. 3 and 4, in which 42 represents a gear-bracket, secured to frame 2, and 43 represents a pivot-bracket,
 10 also secured to said frame and in which latter bracket at 47 arm 46 is pivoted. On shaft 40 in bracket 42 (driven from main shaft 27 through bevel-gears 38-39) is mounted gear 48, meshing on the one side with gear 49 and
 15 on the other side with gear 50, said gears also being pivotally mounted in bracket 42 on shafts 51-52, respectively. Upon the forward end of shaft 52, Fig. 4, is mounted crank-disk 53, bearing a crank-pin 54. On
 20 said pin is mounted a sliding block 55, having a pair of its opposite sides suitably grooved for engagement with ribs 56 on the inside of slot 57 in arm 46. By means of said crank, arm 46 may be oscillated inwardly and
 25 outwardly with respect of the path of the bag-blank. Upon the forward end of shaft 51 is mounted another crank-disk 58, similar to disk 53 on shaft 52. Crank-disk 58 is provided with a hole 59 eccentric to the axis of
 30 rotation of said disk, and in said hole is mounted pivot 60 of grooved block 61. Groove 62 in said block is preferably provided with undercut sides for sliding engagement with the complementarily-fashioned
 35 sides 63 of the shank portion 64 of striker 44. At 65 the rearward end of shank 64 is perforated for the reception of pivot-pin 66; by which pin said shank is pivoted to the free end of lever 46. Said free end is preferably
 40 bifurcated at 67 for the reception of said rearward end of striker 44. By the herein-described means the cutting edge 88 of striker 44 may be caused to travel at high speed across the path of the bag-blank and
 45 then withdraw, so as to pass backwardly around that path to repeat the operation, as indicated by the dotted line P, Fig. 3. At 44^a said striker is shown in dot-and-dash lines in one position of its backward path.

50 The severing mechanism which I have just described is not claimed herein, as it has been made the subject-matter of a separate application, Serial No. 240,401, filed March 14, 1905.

55 On studs 68-69, inreaching from the side frames, respectively, a guide-table 70 may be supported to assist the delivery of the advancing end of the bag-tube to rolls 16-17. If desired, some form of slacker (indicated in a
 60 general way by S) for the paper tube may be provided in rolls 16-17 to assist in the operation of severing the bag-blanks. Also said roll 16 is preferably supplied with a creaser-blade, as 233, for coaction with a creaser-
 65 groove, as 234, in roll 17 for forming the main

transverse crease across the bag-blank. Succeeding rolls 16-17 is another pair of feed-rolls 71-72 for delivering the severed bag-blank onto folding-roll 75. Upper roll 71 is geared to lower roll 72 by means of gears 73-74, respectively, and is preferably urged toward
 70 said roll 72 by gravity, shaft 76 of roll 71 being guided in U-shaped boxes 78-79 in side frames 2-3, respectively. Between rolls 16-17 and 71-72 a guide-table 77 is preferably
 75 supplied, fast on shaft 80, supported from side frames 2-3. A similar table 81, similarly supported, may be supplied between rolls 71-72 and folding-roll 75.

Folding-roll or carrier 75 is fixed for revolution on shaft 82, suitably mounted in sleeve-bearings 84-85, projecting inwardly from side frames 2-3, respectively. Said sleeve-bearings are each provided with a flange, as 91, and which flanges may be secured to their respective side frames by means of screws, as 83.
 85 Said folding-roll 75 may be driven by a gear 86, fixed to its shaft 82 and meshing with gear 87 on shaft 89, which shaft is also mounted for revolution in sleeve 178 and in side frame 3 and carries thereon transfer-roll 92. Said shaft 89 has also mounted thereon miter-gear 93, meshing with miter-gear 94 on the forward end of shaft 37. Gear 87 is adjustably secured to its shaft 89 by means of a
 95 flange or disk 97, keyed or otherwise fixed to said shaft, and to which flange said gear is held by means of bolts 98. Said flange is provided with slots, as 99, for the passage of said bolts, and which slots allow of the shifting
 100 of flange 97 and gear 87 in their relation to each other. Folding roll or carrier 75 may be provided with one or more folding-beds fixed thereon; but in the present instance I
 105 have chosen to provide one only, 102. Mounted upon and revolving with said folding-roll are a pair of oppositely-disposed side clips 100-101 and a front clip 105 for clamping the lower ply of the tucked bag-blank to the peripheral face or folding-bed 102 of said roll.
 110 Said side clips are of a well-known type, pivoted below the face of the folding-bed, as at 103, and each provided at its lower end with a roll, as 104, for engagement with suitable cams, as 106. Said side clips are preferably closed by springs, as 107, and opened by the engagement of their rolls with their
 115 respective cams. Front clip 105 is of a well-known type and is pivoted at 108 in roll 75. Said front clip has an inwardly-reaching arm 109, bearing a roll 110 for engagement with fixed cam 111, which cam is operative to open said front clip, and spring 112 is provided to close said clip when permitted by
 120 said cam 111. Said front clip preferably comprises two gripping members, Fig. 2, whereby room is furnished for the entrance therebetween of front clip 125 on roll 92. Roll 75 is also provided with a supplementary front finger 115, which is more fully set forth
 125 130

and claimed in United States Patent No. 800,337, granted to me September 26, 1905, and to which reference may be had. I preferably arrange said finger 115 in the form of two rearwardly-reaching members, Fig. 5, of sheet metal, so as to be light and somewhat yieldable. Said members are fixed at their forward ends to rock-shaft 113, mounted in sleeve 114 of lever 116, pivoted at 117 in roll 75. Sleeve 114 is provided with slots 118, through which the members of finger 115 may pass for attachment to shaft 113. One end of shaft 113 extends outwardly from sleeve 114 and carries arm 119, which arm in turn carries roll 120 for engagement with fixed cam 121 on sleeve 84. A spring 122 is effective to maintain roll 120 in contact with cam 121. Mounted on arm 116 and about midway its length is roll 123 for engagement with fixed cam 124 on sleeve 85. By means of cams 121 and 124 and the mechanism just described as operated thereby supplemental front finger 115 may be passed into the mouth of the bag-blank and held onto the lower ply thereof during the early part of the formation of the diamond fold to assist in the folding thereof and to prevent the tearing of the blank. During the operation of said supplemental front finger 115 front clip 105 is raised from engagement with the bag-blank by means of the high place 127 of cam 111.

The mechanism which I have provided for turning over the upper ply of the bag-blank for the formation of the diamond fold is somewhat in the nature of the mechanism employed by me for the same purpose in my copending application, filed April 26, 1904, Serial No. 204,992, and to which reference may be had. The present means differs from that of said copending application particularly in that the present means is fast to the folding-roll and revolves round and round with it, whereas the means of said copending application is mounted for oscillation forwardly for coaction with the folding-bed and backwardly to its initial position to repeat the operation. In the present improvement two pairs of oppositely-disposed grippers 130 132 and 131 133, respectively, are suitably mounted upon trunnions 134 135, respectively. Said trunnions are mounted for oscillation in bifurcated brackets 128 129, respectively, outstanding from either side of folding-roll 75. As said grippers and their operating mechanisms are right and left duplicates of each other, the description of one will suffice for both. Trunnion 134 is provided with a head 140, having ears 136 extending forwardly therefrom. Between said ears on pin 137 the rearward end of gripper-blade 132 is pivoted. Adjacent to ears 136 in head 140 is a hole for the reception of shank 146 of swivel-head 139. Said swivel-head is provided with ears 138, between which on pin 147 the rearward end of gripper-blade 130 is pivoted, whereby said

blade is allowed movement inwardly and outwardly with respect of the folding-bed and upwardly and downwardly with respect of gripper-blade 132. Said blades may be urged to their outward positions by springs 141 142, respectively, and blade 130 may be urged away from blade 132 by means of flat spring 143, fast to blade 132 and pressing upon blade 130. Trunnion 134 is perforated from end to end for the passage of plunger 144, which plunger is provided at its inward end with a T-head 145 for engagement with gripper-blades 130 132 and by which means said gripper-blades may be forced inwardly at proper times toward and over the folding-bed for engagement with a bag-blank thereon. On bracket 128 are outstanding ears 148, between which, on pin 150, is pivoted arm 149. One end of said arm engages the outer end of plunger 144, and the other end carries a roll 151 for engagement with fixed cam 152, fast on sleeve 84. By means of said cam as roll 75 revolves arm 149 may be rocked on its pivot and plunger 144 thrust inwardly for engagement with gripper-fingers 130 132. Roll 151 is urged toward cam 152 by means of springs 141 142, which pull backwardly on blades 130 132, respectively, and which blades in turn impinge upon T-head 145 of plunger 144 and which plunger contacts at its outer end with the upper member of arm 149.

For forcing gripper-blade 130 downwardly toward gripper-blade 132 cam 162 is provided. Said cam is fixed to head 140 of trunnion 134 by means of a screw or screws and is provided with a suitable inclined working face 164, which when gripper-blade 130 is thrust inwardly by T-head 145 of plunger 144 forces said blade downwardly toward opposite blade 132. On trunnion 134 and between ears 252 153 of bracket 128 is fixed gear 154 for engagement with segment 155 for rotating said trunnion and gripper-fingers 130 132, carried thereon. Said segment 155 is fast on shaft 156 between ears 157 158 on bracket 128. Said shaft extends inwardly beyond ear 158 and has fast thereon arm 159, bearing roll 160 for engagement with fixed cam 161 on sleeve 84 and by which means segment 155 may be oscillated at proper times to rotate gear 154 and trunnion 134, and thus turn over gripper-fingers 130 132 from the position shown, for instance, in Fig. 6 to that shown, for instance, in Fig. 9. Gripper-fingers 131 133 on the opposite side of folding-roll 75 are actuated in unison with gripper-fingers 130 132 by mechanism substantially alike in all respects to that just described in connection with said gripper-fingers 130 132.

On shaft 165, fixed in frames 2 3 somewhat in advance of folding-roll 75, are supported two oppositely-disposed rearwardly-reaching stationary breakers and ironers 166 167. In the form illustrated said breakers and

ironers each comprise an arm, as 168, having at one end a clamp-hub, as 169, for engagement with shaft 165 and at the other end a blade, as 170, which is the breaker and ironer proper. The faces of these breakers and ironers have inwardly-inclined approximately helical conformations commencing at a position relatively remote from the periphery of roll 75, as 172, and at which portion thereof said faces have their maximum inclination to said roll periphery, and said faces continue to a position of close proximity to said periphery, as 173, and at this final position are substantially parallel thereto.

Mounted on shaft 174 in sleeves, as 176, inwardly reaching from side frames 2 3 and below diamond-folding roll 75, is flap-folding roll 175. Between said rolls 75 and 175 for rolling coaction with both thereof is mounted transfer-roll 92. Said transfer-roll is fixed on shaft 89 for revolution therewith, said shaft turning in frame 3 and in sleeve 178, inwardly reaching from frame 2. Said transfer-roll is provided with a pair of oppositely-disposed side clips, as 179. Clip 179 is pivoted in said roll at 180 and is operated directly from fixed cam 181 on sleeve 178, and the corresponding clip is similarly pivoted on the other side of roll 92 and is operated from clip 179 by means of link 235. Said transfer-roll is also provided with a front clip 125, pivoted at 182 therein, and which clip has an inwardly-extending arm 183, bearing a roll 184 for engagement with fixed cam 185 on sleeve 178 in the usual manner. Said front clip 125 is preferably comparatively narrow and so arranged as to pass between the members of front clip 105 of roll 75 without interfering therewith.

Flap-folding roll 175 is preferably provided with a plurality of folding-beds. In the present instance two are shown, 186 187, each being provided with the usual side clips, as 188, and front clip, as 190. Said side clips are pivotally mounted, as at 191, and are provided with rolls, as 192, for engagement with the usual cams, as 193. The front clips, as 190, are pivoted at 194 and have inwardly-extending arms, as 196, carrying rolls, as 197, for engagement with the usual cam 198. Front clip, as 190, is preferably arranged in two somewhat separated members similar to the members of front clip 105, so as to allow the passage between said members thereof of front clip 125 of transfer-roll 92. However, some other means to prevent interference, as offsetting said clips sidewise, would be equally efficient. Cams, as 193 and 198, are fixed cams and are supported on sleeves projecting inwardly from side frames 2 3—as, for instance, sleeve 176 from frame 2.

The usual flap creasing and gumming segment as provided is indicated by 200, and it is deemed unnecessary to insert further description herein.

The means I have provided for folding the rear and front flaps of the diamond include, first, a rear-flap-folding mechanism comprising a pair of oppositely-disposed rotary folding-blades, as 199, and which are mounted with their operating mechanism on brackets, as 201, rearwardly extending from the sleeves, as 176, in which shaft 174 has its bearings. Said rear-flap folders are fully described and claimed in the copending application of Smith, filed June 28, 1904, Serial No. 214,563, and to which reference may be had. As said mechanism forms no part of the present improvements, further description is deemed unnecessary. For folding the front flap the usual oscillating blade 202, guide 204, squeezing-rolls 205 206, and delivery-rolls 207 208 are provided.

Flap-folding roll 175 and its coöperative and succeeding mechanism are driven as follows: Fixed on one end of shaft 174, to which said roll 175 is fixed, is flange 209, provided with slots, as 210, through which bolts, as 211, pass for engagement with the flange-like hub of gear 215, whereby said flange 209 and gear 215 are adjustably secured to each other. Said gear meshes with and is driven by gear 87 on shaft 89 and in its turn meshes with and drives gear 214 on paste-segment shaft 213 with rear-flap-folder gear 216 on shaft 212 in bracket 201 and with gear 217 on shaft 218. Shaft 218 carries cam 219 for engagement with roll 220 on arm 221, which arm carries segment-gear 222 for engagement with segment 223 on shaft 203, whereby blade 202 may be oscillated to fold and deliver the leading end of the bag-blank into the bite of rolls 205 206. Roll 208 on shaft 224 may be driven from gear 217 by gear 226 on said shaft 224, and roll 206 on shaft 225 may be driven from gear 226 by means of gear 227 on said shaft through intermediate 228. Rolls 205 and 207 may be driven by friction from rolls 206 and 208, respectively.

The operation of my improved machine is as follows: Suitable tucked-paper tubing is supplied by tube mechanism T or from other convenient source to rolls 4 and fed forward past the serrated edges of blade 13 and float 12 and where the projecting end of said tubing is torn off by hand against said serrated edges. At this position of the leading end of the bag-tube edge 88 of striker 44 should have just passed said serrated edges, Figs. 1 and 3. The machine may now be started and the tucked tubing is fed forward by rolls 4 over table 70 into the bite of rolls 16 17. During this time striker 44 has passed upwardly in its path P, Fig. 3, then downwardly and retractively in said path, and so onward therein until a suitable length of the bag-tube for a bag-blank has been fed forward of the serrated edges of blade 13 and float 12, at which time striker 44 will have reached a position closely approaching that

shown in Fig. 3 and will be traveling upward at a high rate of speed. It will immediately thereafter strike the bag-tube just in advance of said serrated knife-edges, and said tube, being held in the grip of rolls 4 and 16 17, respectively, will have a portion severed therefrom. About this time creasers 233 and 234 will coact to form the main transverse crease in the bag-blank, and rolls 16 17 are preferably so situated in relation to the striker that said creasers 233 234 therein, respectively, will engage the bag-tube at the time of severance thereof, thereby adding to the gripping efficiency of said rolls. The severed bag-blank continues its forward movement over table 77, between rolls 71 72, and over table 81 onto folding-bed 102 of roll 75. The bag-blank is delivered onto said folding-bed with the lower ply of the leading end thereof in position to be clamped to said folding-bed by front clip 105, and which clip immediately closes thereon. Directly thereafter side clips 100 101 enter and grip to said folding-bed the respective lower plies of the side tucks of the blank, Fig. 6. Closely following this operation the forward movement of roll 75 about its axis 84 causes roll 151 to ride up onto the high part of cam 152, whereby arm 149 is rotated on its pivot 150, plunger 144 is thrust inwardly, and fingers 130 132 are thereby swung inwardly on their respective pivots, the former above and the latter below the upper ply of the adjacent side tuck of the bag-blank. At the same time the shank of upper finger 130 contacts with the inclined under face 164 of cam 162, and said finger is thereby forced downwardly toward finger 132 and said upper ply of the bag-blank is gripped therebetween. Synchronously with this operation gripper-fingers 131 133 on the opposite side of the folding-bed, actuated by means similar to those which actuate fingers 130 132, engage and grip the upper ply of the side tuck adjacent to them. The forward movement of the bag-blank on the curved face of the folding-bed tends to open the mouth of said blank, whereby an entrance is afforded for supplemental front finger 115, Fig. 6. Roll 123 on arm 116 thereupon travels in its cam 124 toward axis 82, and said supplemental front finger on the free end of said arm moves toward and into said mouth of the bag-blank. Also roll 120 travels inwardly on cam 121 toward axis 82, and said finger 115 is thereby lowered onto the inside face of the lower ply of the bag-blank, clamping said blank rearwardly of front clip 105 to the folding-bed, Fig. 7. Immediately thereafter roll 110 of front-clip arm 109 rides up onto high part 127 of cam 111, and said front clip is lifted from the bag-blank, thus relieving the strain from the forward end of the blank during the folding of the diamond, Fig. 8.

During the passing into engagement of sup-

plemental front finger 115 and the temporary release of the bag-blank by front clip 105 roll 160 on arm 159 of segment 155 is mounting rise 229 of cam 161, whereby said segment rotates, through gear 154 thereon, trunnion 134 and gripper-fingers 130 132, which fingers have the upper ply of one of the side tucks of the bag-blank in their grasp. By similar means gripper-fingers 131 133 are rotated with their trunnion 135, and the upper ply of the bag-blank is lifted and turned backwardly about the center of trunnions 134 135 as an axis from the position of Fig. 6 through that of Fig. 7 and to that of Fig. 8. The sides of the partly-opened bag-mouth in their travel with folding-bed 102 about its axis 82 now impinge against the inclined portions, as 172, of the faces of breakers and ironers 166 167, whereby said sides are turned inwardly and downwardly in the formation of the diamond fold. Roll 75 continuing its onward and clockwise rotation, and fingers 130 132 and 131 133 continuing their backward and anti-clockwise rotations, the upper ply of the bag-blank is folded back onto itself, the front clip resumes its grip on the forward end of the lower ply of the bag-blank, the supplemental front finger is withdrawn, and the diamond-folded blank passes over the less-inclined parts of the breakers and ironers and onto those parts thereof, as 173, which are substantially parallel to the folding-bed. The diamond-folded blank is thus ironed down against the periphery of roll 75, Fig. 9. Rolls 151 and 230 then run off the ends of their respective cams 152 231, whereby gripper-fingers 130 132 and 131 133, respectively, are withdrawn from engagement with the bag-blank. Roll 75 continuing its revolution, the forward end of the diamond-folded blank is delivered into the grip of front clip 125 on transfer-roll 92, and thereupon front finger 105 of roll 75 releases its hold thereon, Fig. 10. Side clips 100 101 on roll 75 then release their hold on the bag-blank and side clips, as 179, of roll 92 clamp each side, respectively, of said blank to the periphery of said roll. Roll 75 continuing its clockwise movement, trunnions 134 135 and their respective gripper-fingers are rotated in a clockwise direction to their initial positions ready to repeat their operation. Transfer-roll 92 continues its forward and anti-clockwise rotation and presents the diamond-folded blank to one of the folding-beds, as 187, of roll 175, with the leading end of said blanks in position to be gripped by front clip 195, which clip thereupon closes, and front clip 125 of transfer-roll 92 releases its hold on said blank. Rolls 92 175 continue their respective onward movements, and just before side clips, as 179, of said roll 92 reach the position of contact of said rolls said side clips open, and side clips, as 189, of folding-bed 187 on roll 175 directly after passing said position of contact close, thereby gripping the

sides, respectively, of the bag-blank to said folding-bed. Said side clips, as 188 and 189, are so disposed lengthwise of their respective folding-beds 186 187 that the crease for the rear-flap fold of the bag-bottom will be formed just behind said clips—as, for instance, at 232 in folding-bed 187. The bag-blank thus gripped to folding-bed, as 187, of roll 175 now passes onward therewith under pasting and creasing segment 200, front clip, as 195, releases its grip, paste is applied, and the blank creased for the folding of the rear and front flaps thereof. The bag-blank then passes onward under rear-flap folders, as 199, by which the rear flap is turned over forwardly and held down until blade 202 engages said bag-blank, which it does forthwith at the base of the front flap thereof. Side clips, as 189, then release their grip, and said blade 202 delivers the bag-blank onto guide-table 204 and into the bite of rolls 205 206, by which rolls the end flaps are squeezed down onto the bag-bottom and the then completed bag conveyed onward and downward into the bite of delivery-rolls 207 208, from which rolls the finished bag may be delivered to suitable drying means or otherwise disposed of.

I claim—

1. The combination of a revoluble carrier, a folding-bed fixed thereon, means mounted coaxial with the folding-bed and revolving therewith to open out the forward end of a tucked-paper tube and fold the same down into a diamond form, an oscillatable lever pivotally mounted in the revoluble carrier, a front finger 115 mounted in the free end of the oscillatable lever for entering the mouth of the bag-blank to hold the lower ply thereof to the folding-bed during the formation of the diamond fold, all combined and operating together substantially as described.

2. The combination of a revoluble folding-bed having side clips 100, 101 thereon, a pair of oppositely-disposed trunnions 134, 135 mounted for oscillation about their own axes respectively, and for revolution with the folding-bed, a pair of gripper-fingers carried by each trunnion, said fingers being mounted in

their respective trunnions for vibration inwardly and outwardly with respect to the folding-bed and one of each pair of said fingers being mounted for vibration toward and away from the other finger of its respective pair, all combined and operating together substantially as described.

3. The combination of a revoluble folding-bed 102, a transfer-roll 92 and a revoluble folding-bed 187 each having side clips thereon; means coacting with the first folding-bed to open out and fold down into a diamond form the forward end of a tucked-paper tube, and means coacting with the second folding-bed to fold the rear and front flaps of the diamond fold to form a bag-bottom, all combined and operating together substantially as described.

4. The combination of a revoluble folding-bed 102, a transfer-roll 92 and a revoluble folding-bed 187 each having a pair of side clips and a front clip thereon; means coacting with the first folding-bed for forming a diamond fold on the forward end of a tucked-paper tube, and means coacting with the second folding-bed for folding the flaps of the diamond fold to form a bag-bottom, all combined and operating together substantially as described.

5. The combination of a revoluble folding-bed 102, a transfer-roll 92 and a revoluble folding-bed 187 each having means for holding a bag-blank thereon; means coacting with the first folding-bed to open out and fold down into a diamond form the forward end of a bag-blank and means coacting with the second folding-bed to fold the rear and front flaps of the diamond fold, all combined and operating together substantially as described.

Signed at Rumford Falls, in the county of Oxford and State of Maine, this 24th day of September, 1904, in the presence of two subscribing witnesses.

FREDERICK E. STRASBURG.

Witnesses:

THEO. HENDLEY,
HAROLD SMITHWICK.