

No 742,163.

PATENTED OCT. 27, 1903.

H. R. CHADBOURNE, JR., I. S. CRAIG & C. W. B. FULLER.

MACHINE FOR COVERING STRAPS.

NO MODEL.

APPLICATION FILED FEB. 17, 1902.

9 SHEETS—SHEET 1.

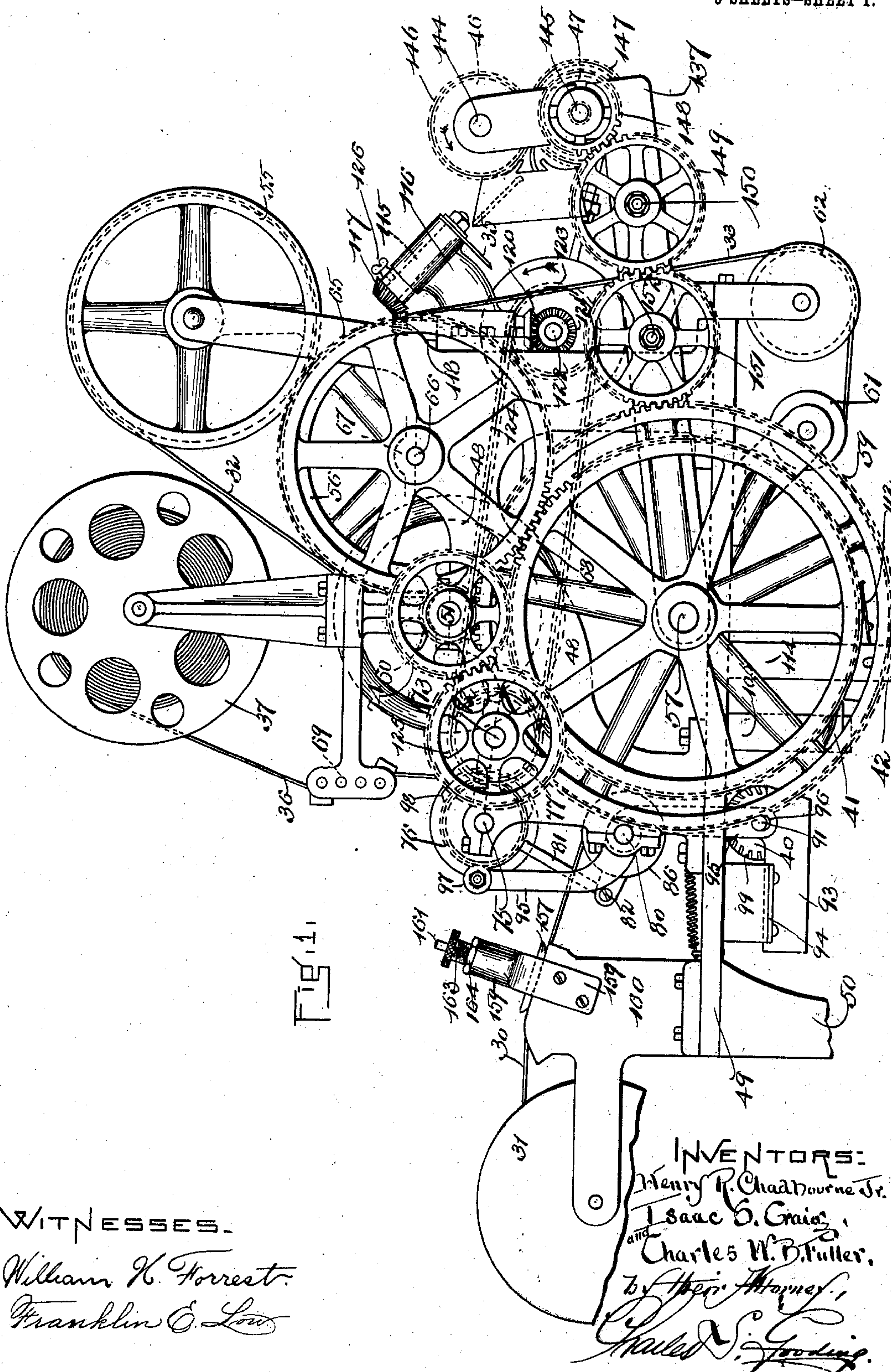


FIG. 1.

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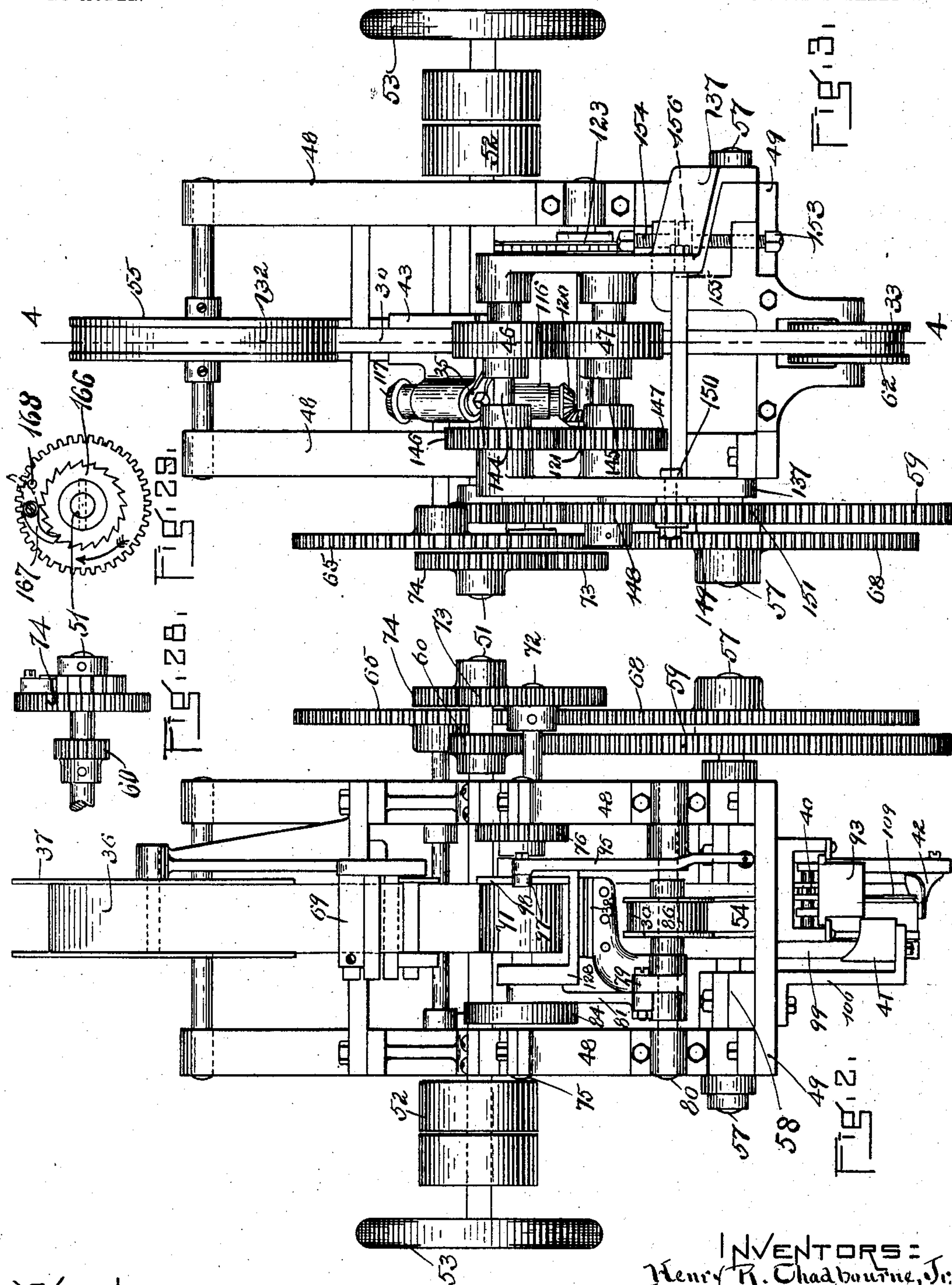
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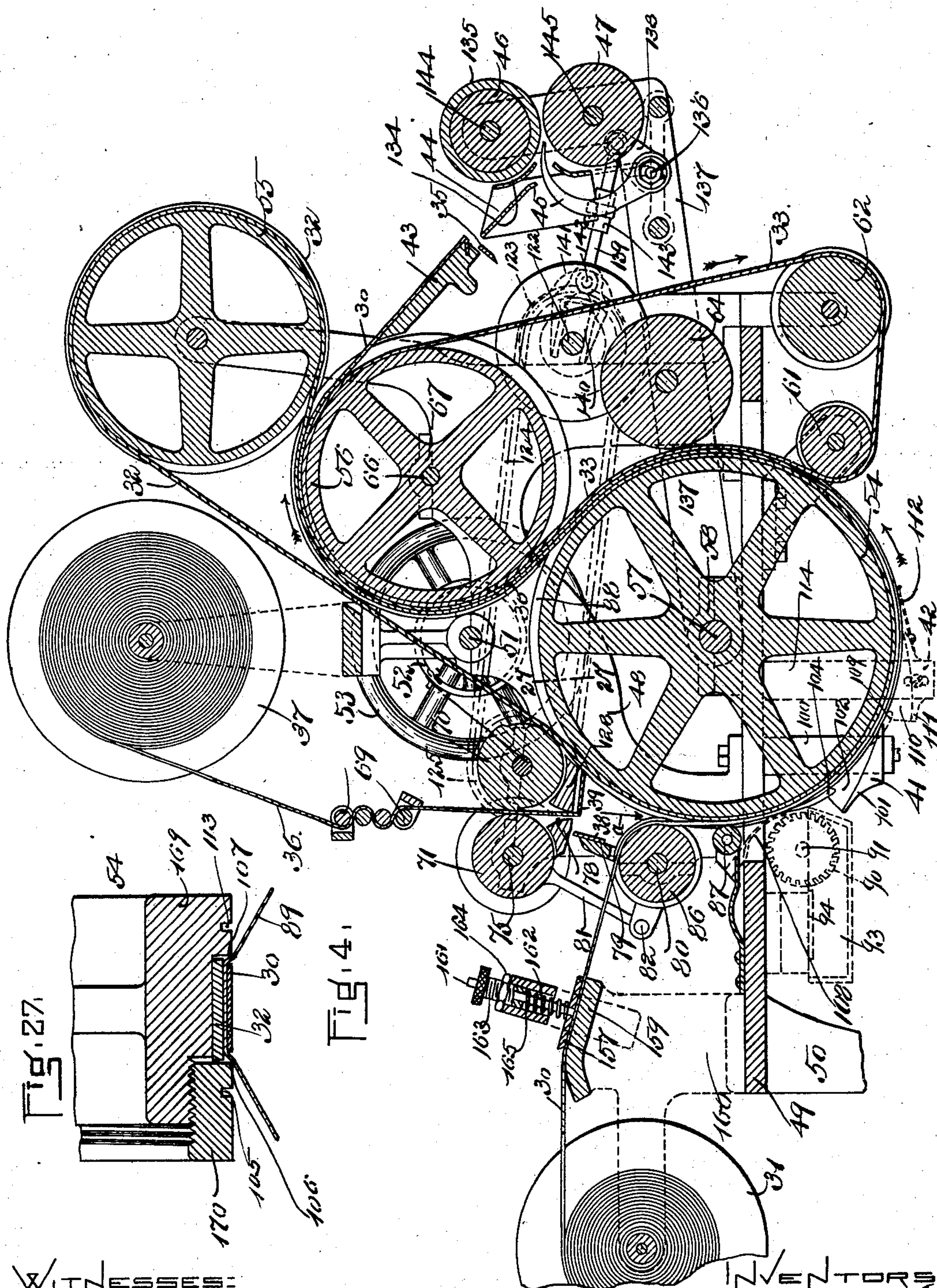
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9 SHEETS—SHEET 4.

NO MODEL.

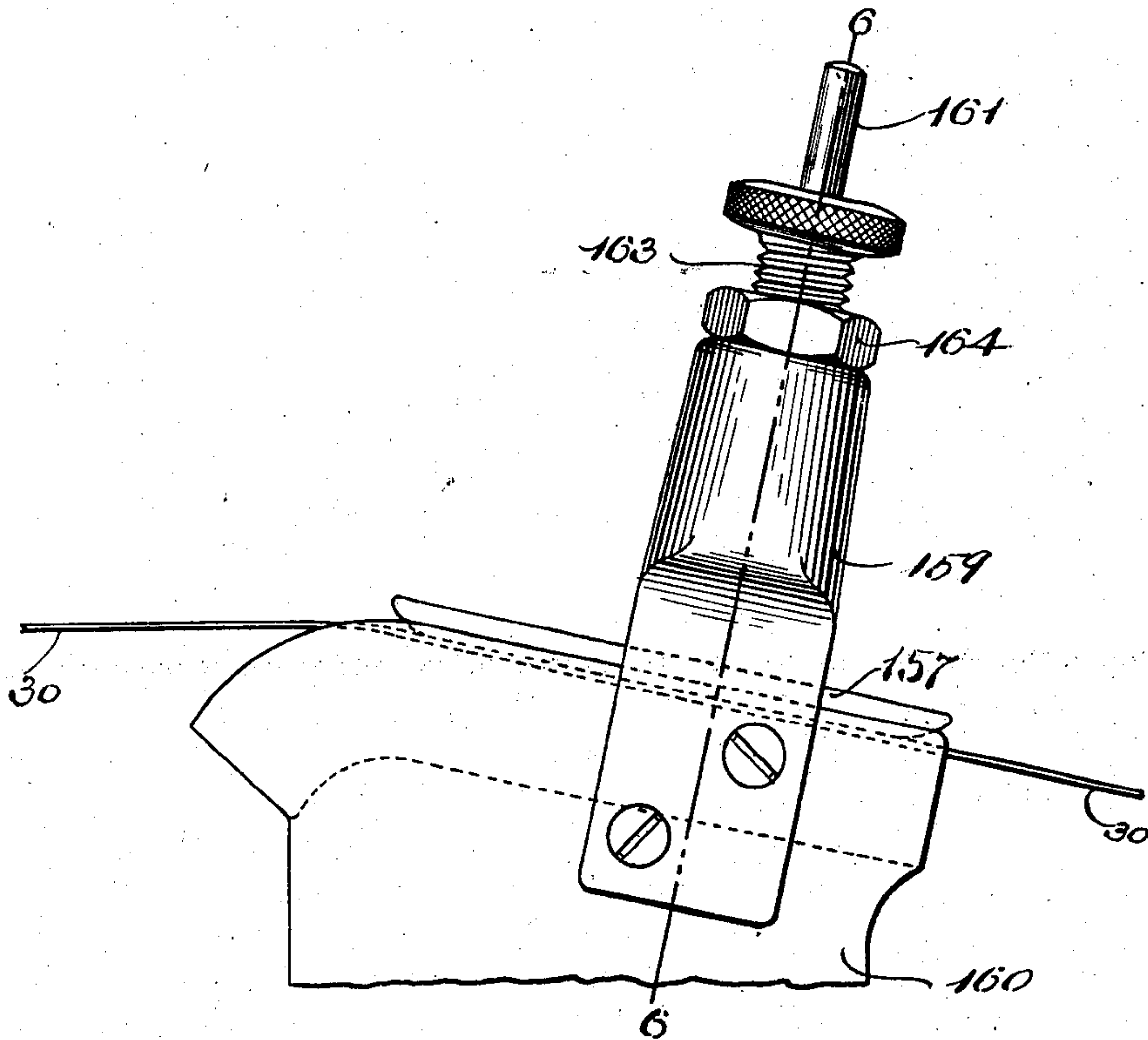
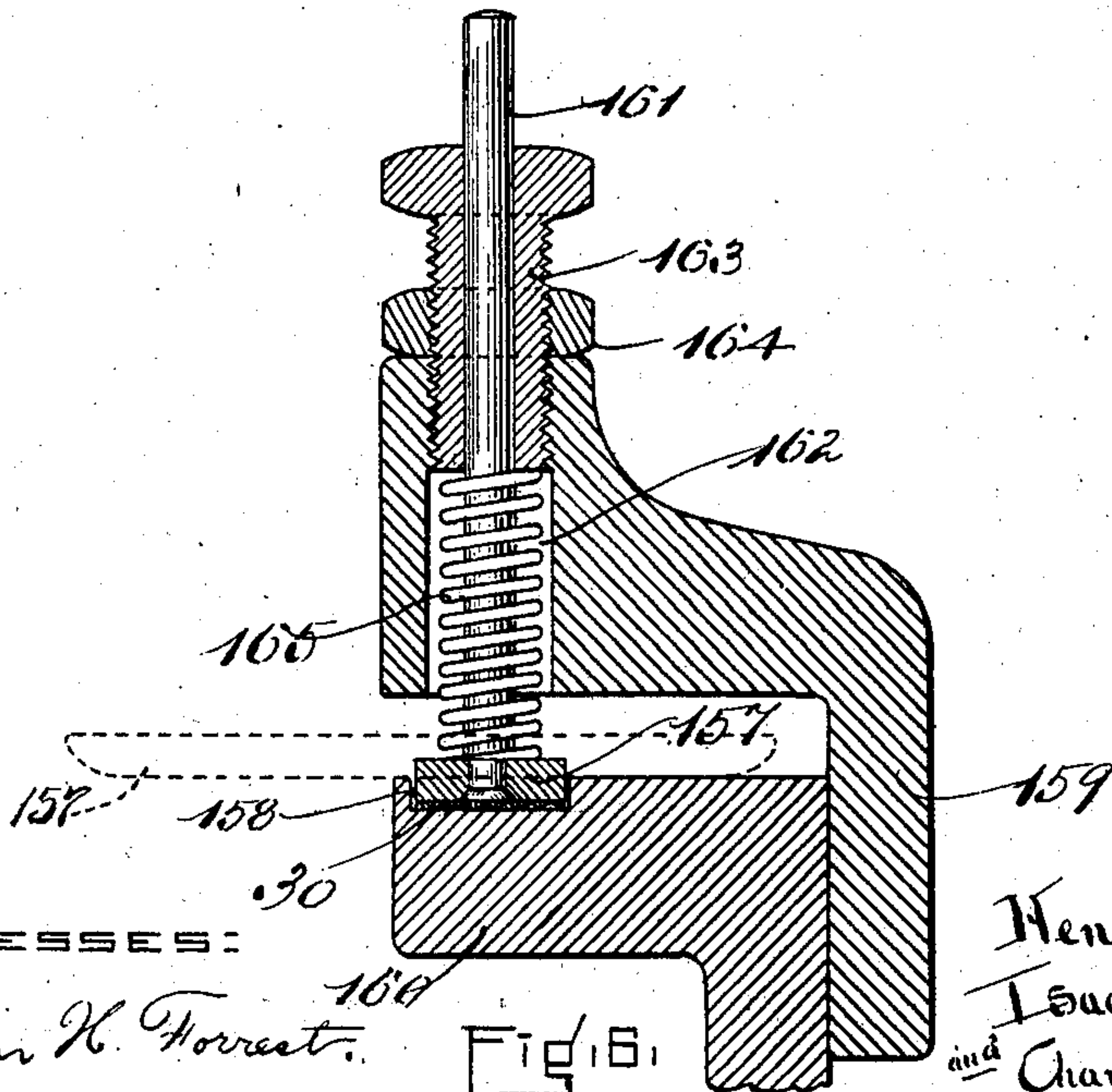


Fig. 5.



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Fig. 6.

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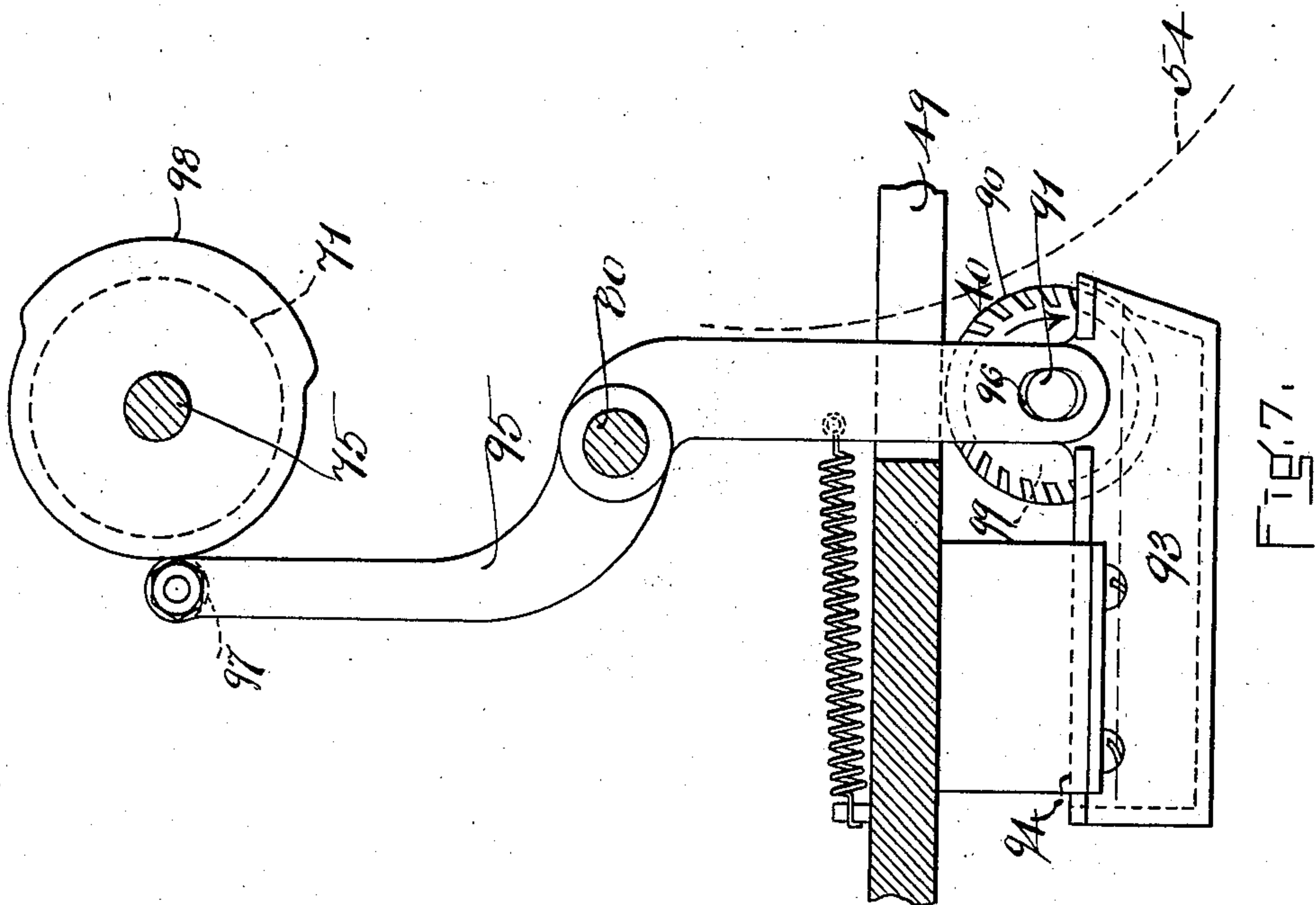
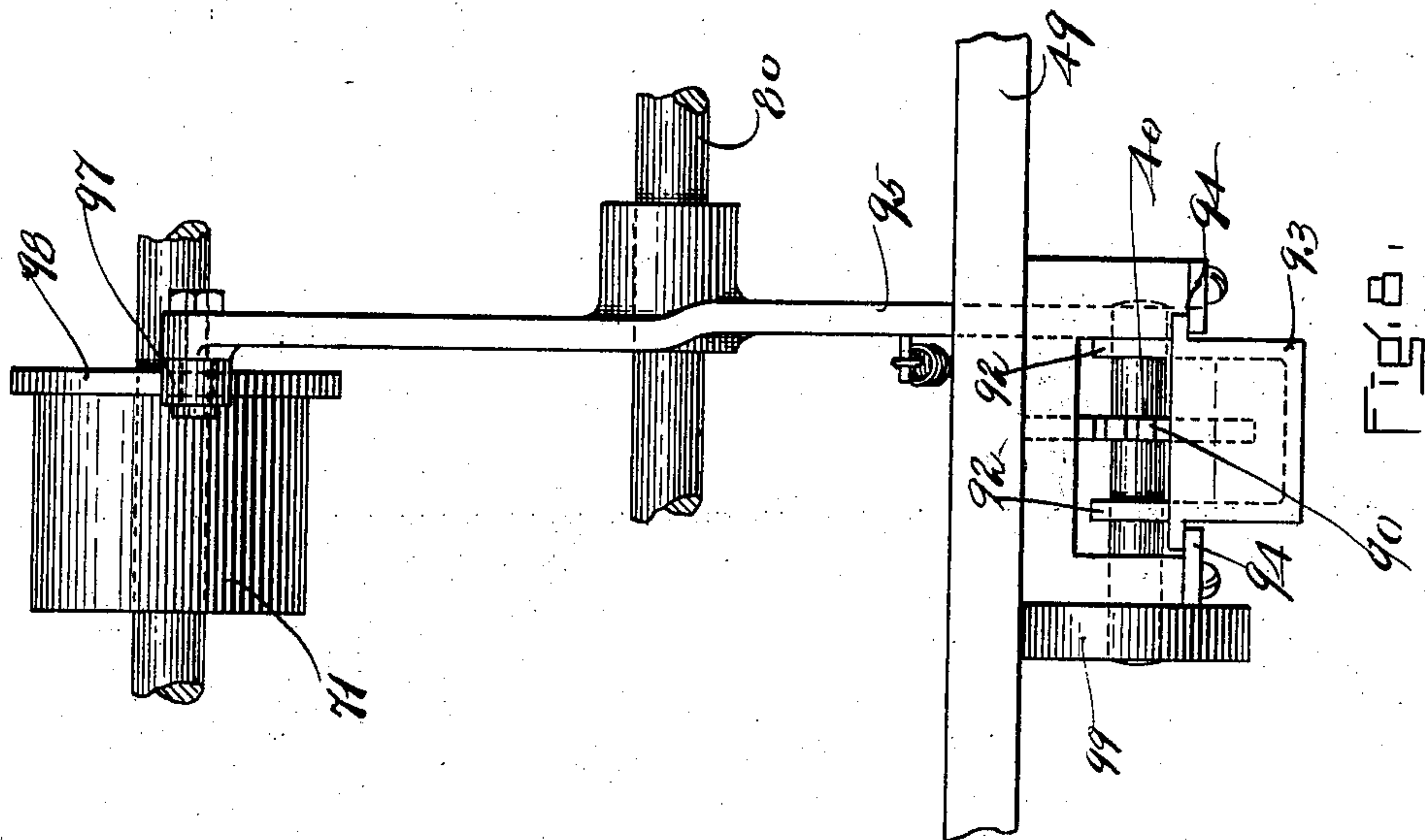
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9 SHEETS—SHEET 5.



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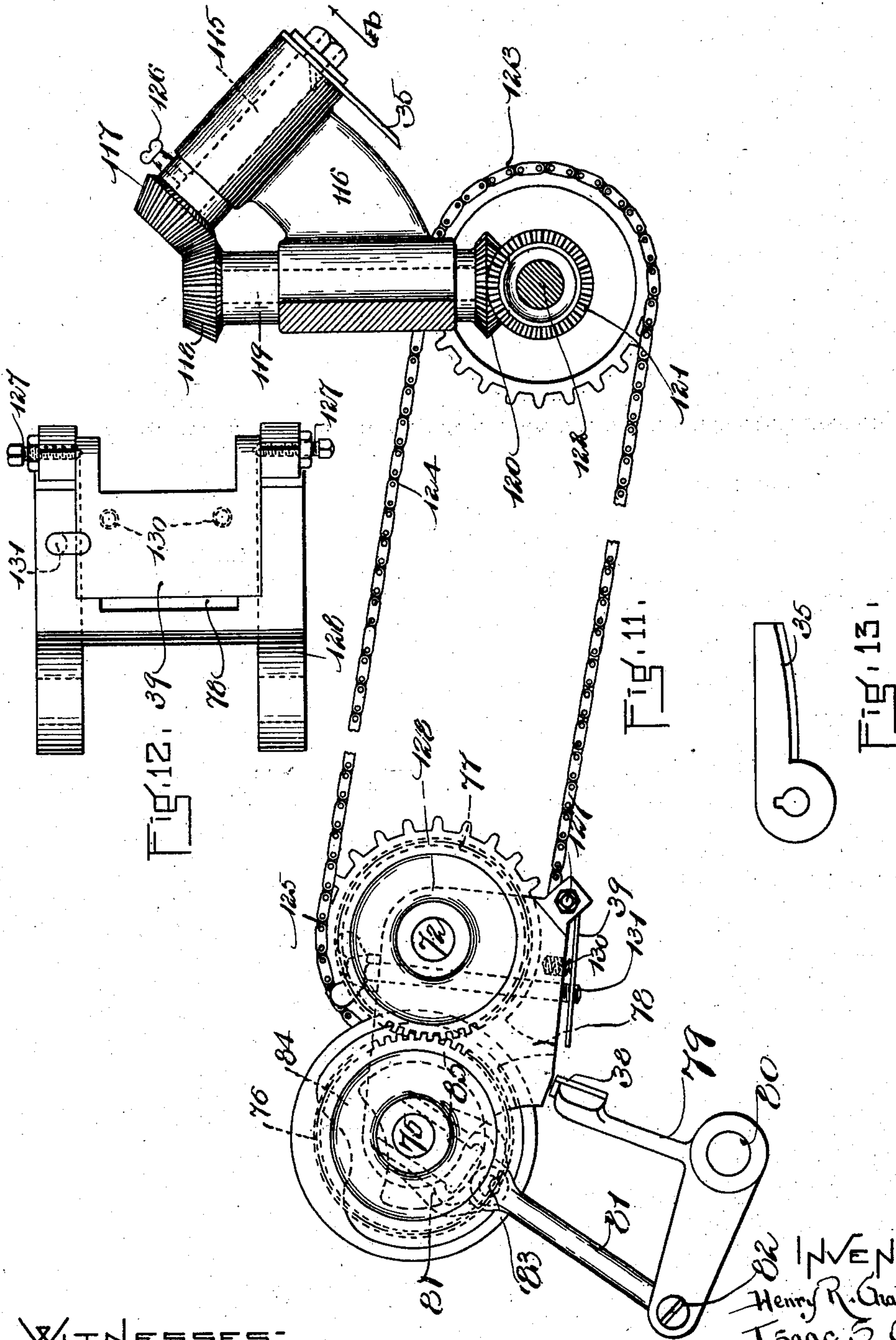
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9 SHEETS—SHEET 7.

NO MODEL.



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9 SHEETS—SHEET 8.

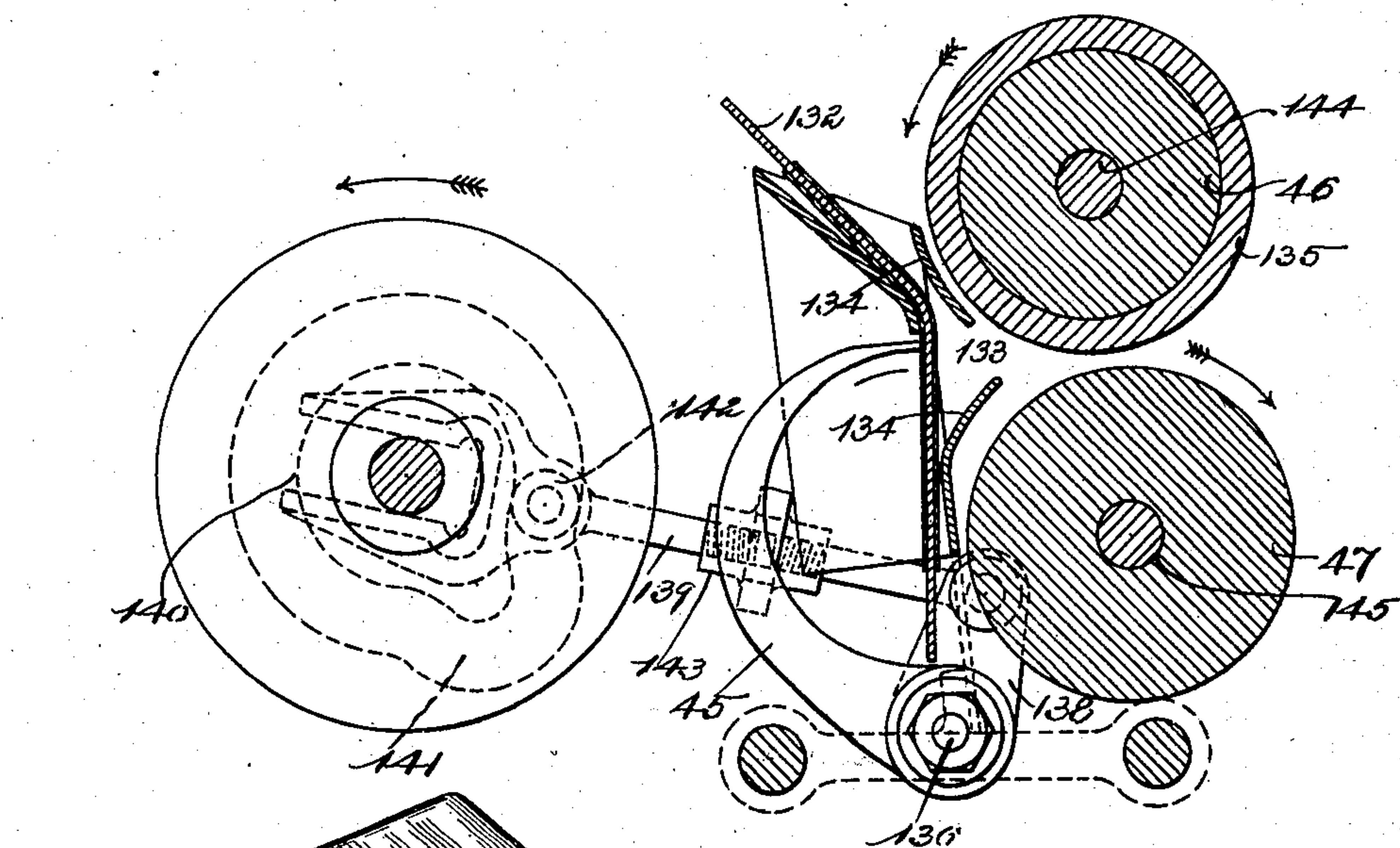


Fig. 14.

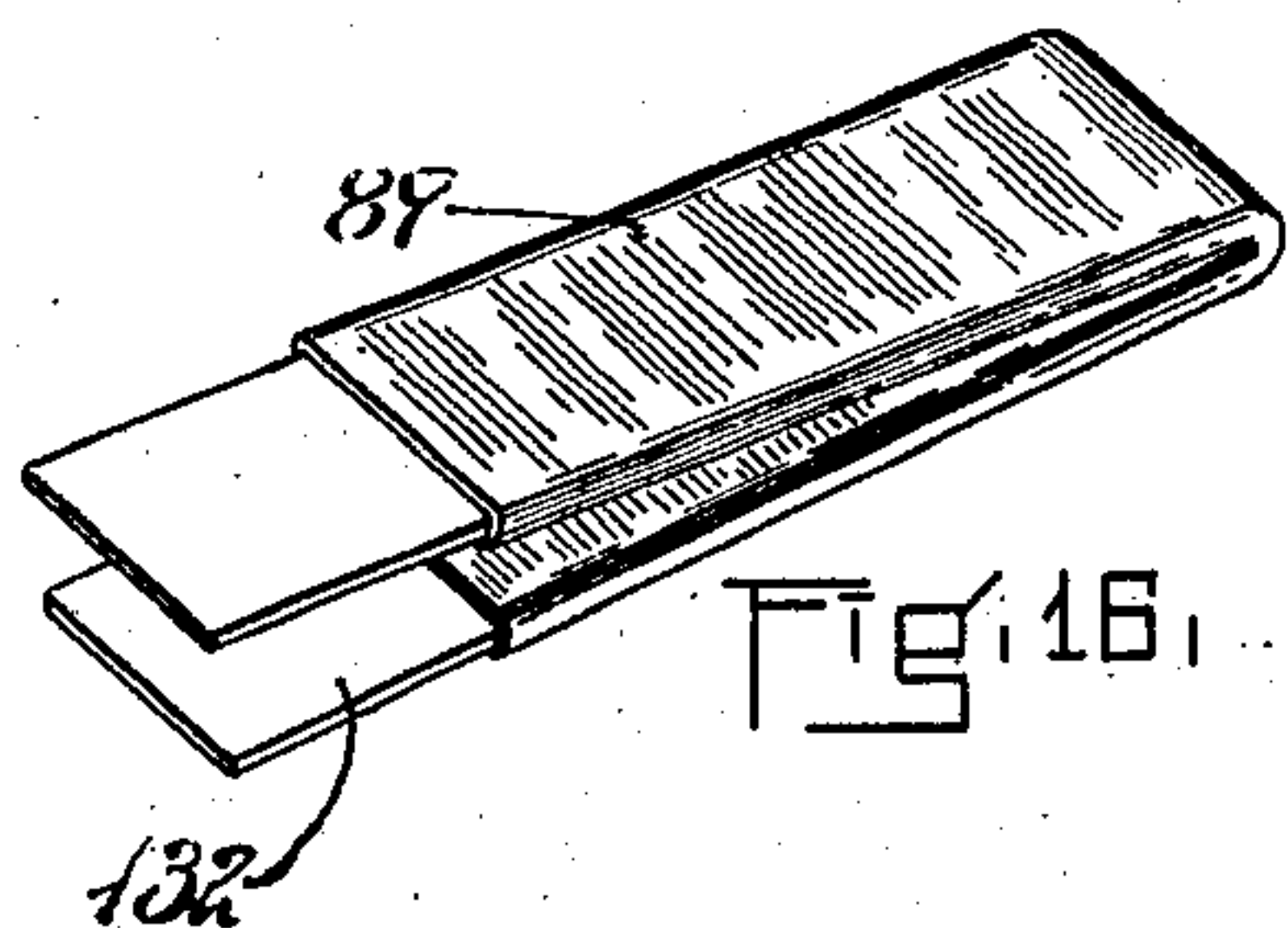


Fig. 16.

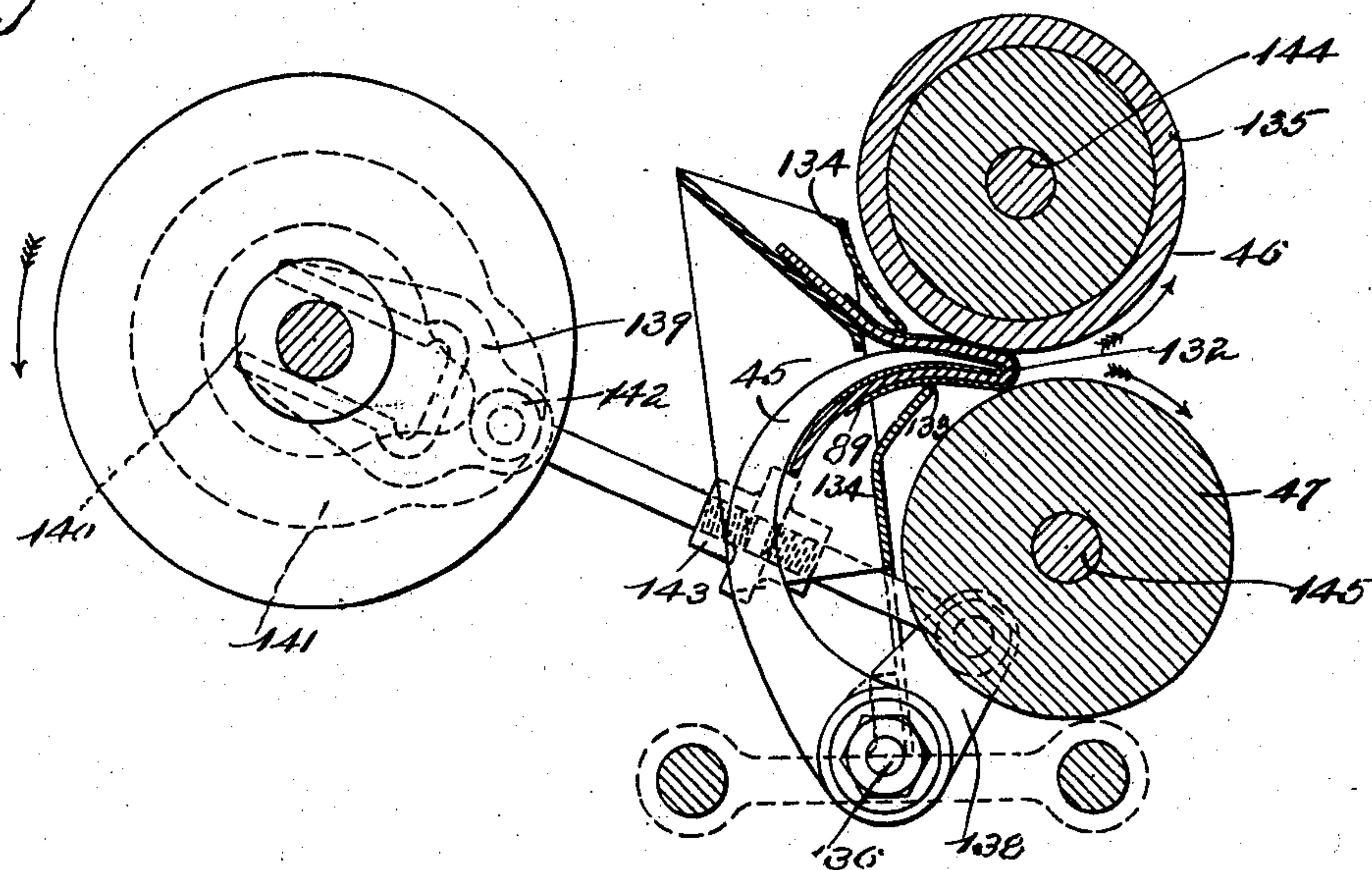


Fig. 15.

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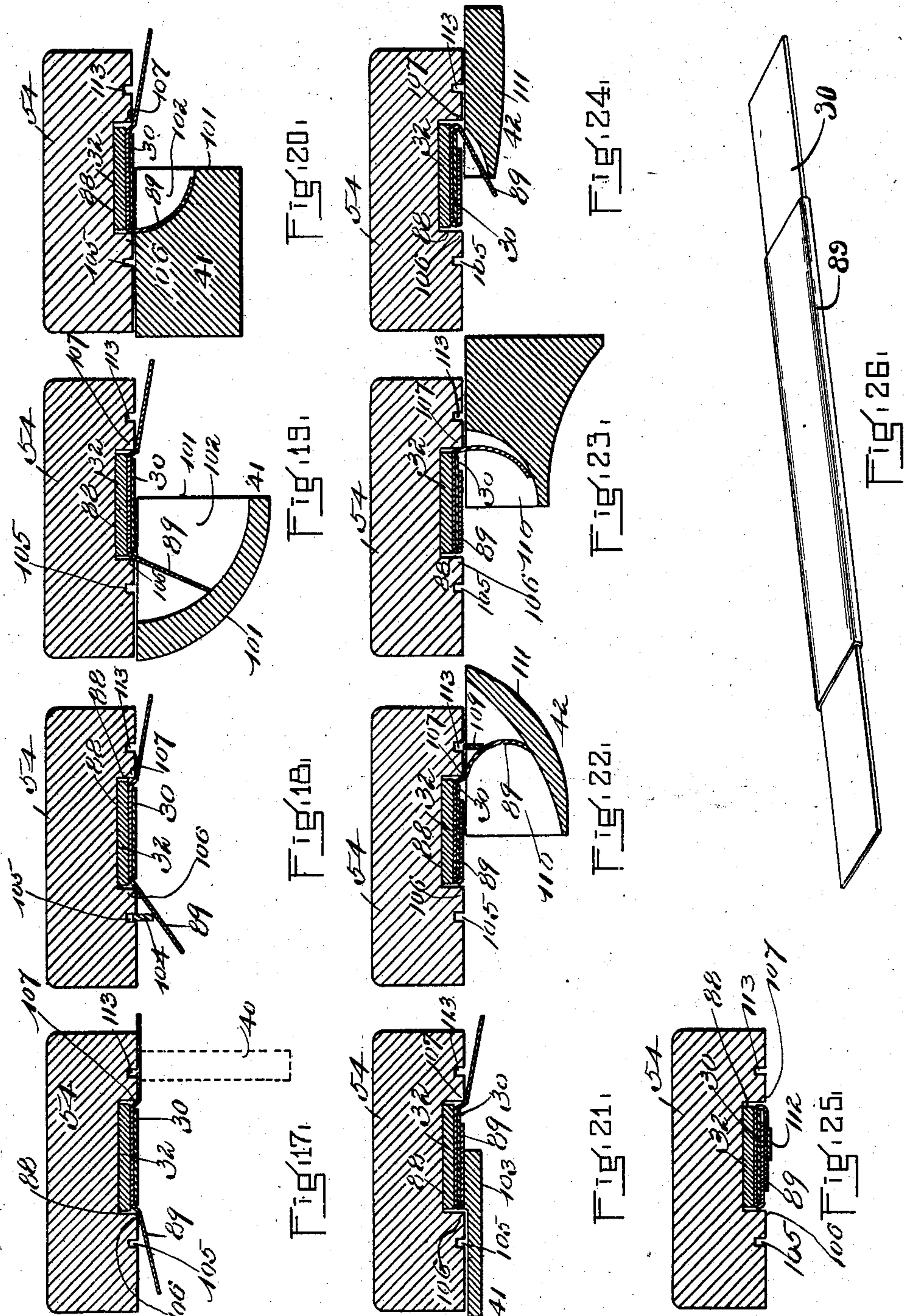
H. R. CHADBOURNE, JR., I. S. CRAIG & C. W. B. FULLER.

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NO MODEL.

9 SHEETS—SHEET 9.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY R. CHADBOURNE, JR., OF WABAN, ISAAC S. CRAIG, OF SOMERVILLE,
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FIRM.

MACHINE FOR COVERING STRAPS.

SPECIFICATION forming part of Letters Patent No. 742,163, dated October 27, 1903.

Application filed February 17, 1902. Serial No. 94,345. (No model.)

To all whom it may concern:

Be it known that we, HENRY R. CHADBOURNE, Jr., residing at Waban, ISAAC S. CRAIG, residing at Somerville, and CHARLES W. B. FULLER, residing at Wakefield, in the county of Middlesex and State of Massachusetts, citizens of the United States, have invented new and useful Improvements in Machines for Covering Straps, of which the following is a specification.

This invention relates to machines in which portions of paper are folded around a continuous strip of tape, paste being applied to said portions of paper before they are folded, so that the same may be stuck together after the folding operation, and after the paper has been folded, as hereinbefore set forth, in portions about said tape the continuous strip of tape is divided between said folded portions of paper, and finally the pieces of tape thus cut off, together with the pieces of paper which are folded about them, are folded in the center, and thus form boot-straps, which are thus covered with paper to prevent the same from being soiled by handling during the manufacture of the boots or shoes to which they are applied.

The object of this invention is to provide a practical, strong, and durable machine which may be run at great speed, thus producing a large amount of work, and which shall be capable of being adjusted to cut and cover boot-straps of different lengths and widths.

The invention consists in mechanism to impart a continuous-feeding movement to a strip of tape, mechanism to feed portions of paper to said tape lengthwise thereof, mechanism to fold said portions of paper around said tape with two opposite sides of said paper in contact with each other, and mechanism to sever portions of predetermined length from said tape.

The invention again consists in mechanism to impart a continuous-feeding movement to a strip of tape, mechanism to intermittently feed a strip of paper lengthwise of said tape, mechanism to sever portions of predetermined length from said strip of paper, and means

to fold said portions of paper around said tape with two opposite sides of said paper in contact with each other.

The invention again consists in the instrumentalities hereinbefore set forth in combination with a device for applying paste to said portions of paper before they are folded around the strip of tape.

The invention again consists in certain improved mechanisms for severing the tape and the portions of paper from the strip of paper, and adjusting and regulating means whereby the time at which the cutting mechanism severs a portion of the strip of tape, constituting a strap, from the main portion thereof may be regulated.

The invention further consists in improved tape-feeding mechanism whereby the tape is fed with speed and the portions of paper are folded and held around said tape, after being folded, until the paste is set.

The invention again consists in the improved means for folding the portions of paper in the direction of their length around the tape.

The invention still further consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a front elevation of our improved machine for covering straps. Fig. 2 is an end elevation taken from the left of Fig. 1 with the tape-reel and tension removed therefrom. Fig. 3 is an end elevation taken from the right of Fig. 1. Fig. 4 is a longitudinal sectional elevation taken on line 4 4 of Fig. 3. Fig. 5 is a side elevation of a tension device for the tape. Fig. 6 is a sectional elevation taken on line 6 6 of Fig. 5. Fig. 7 is an enlarged detail elevation, partly in section, of the paste-receptacle and its actuating mechanism viewed from the same direction as in Fig. 1. Fig. 8 is a side elevation of the parts illustrated in Fig. 7, taken from the left-hand side thereof. Fig. 9 is an enlarged front elevation in detail of the two folders (and a portion of their supporting-brackets) by which the paper is folded about the tape lengthwise

thereof. Fig. 10 is a side elevation of the parts shown in Fig. 9 as viewed from the left of said figure. Fig. 11 is a detail side elevation, partly in section, of the paper and tape cutting mechanisms. Fig. 12 is an underneath detail plan view of the paper-guide and knife-supporting frame. Fig. 13 is a detail elevation of the rotary cutter. Fig. 14 is a sectional elevation of the folding mechanism by which the straps are folded transversely after they have been severed from the strip of tape. Fig. 15 is a view similar to Fig. 14, showing the parts in a different position. Fig. 16 is a perspective view of one of the straps, showing the same covered with paper and folded as it appears after passing through the machine. Figs. 17 to 25, inclusive, are detail sections taken on lines 17 17 to lines 25 25, inclusive, of Fig. 9, illustrating the manner in which the paper is folded around the tape. Fig. 26 is a detail view of a strip of tape covered with one portion of paper as it appears before being folded. Fig. 27 is an enlarged detail section of the rim of the grooved tape-feeding pulley, taken on line 27 27 of Fig. 4. Fig. 28 is a left-hand end elevation, and Fig. 29 a front elevation, of a modified means of connecting the main shaft of the machine with one of the driving-gears.

The general operation of the machine is as follows: The tape 30 is fed in a continuous strip from a reel 31 between two endless belts 32 and 33 to a rotary cutter 35. The paper 35 36 for covering the straps is fed intermittently from a reel 37 to the cutters 38 39, which sever portions from the main strip of paper, said portions being of a width about three times that of the width of the piece of tape to be covered. These portions of paper 40 after having been divided from the main strip are fed between the tape 30 and the endless belt 32, by which they are carried to a paste-wheel 40, which applies paste to one side of said portion of paper lengthwise thereof and parallel to the strip of tape. The side of the portion of paper which is not pasted is then folded over by a stationary folder 41, thence passes to a second stationary folder 42, located upon the opposite side of the tape from the stationary folder 41, and the other side of the paper, said side of the paper being the pasted side, is then folded over the side folded by the stationary folder 41. The two sides 55 of the paper are now folded across the tape, and said tape traveling forward in the direction of the arrow passes between the endless belt 33 and the endless belt 32 and is carried by said belts to the point at which 60 they diverge, when it is thrown out upon inclined chutes 43 and 44, down which it is fed to the rotary cutter 35, which severs a portion of the tape from the main body thereof, said portion being covered with paper, as 65 hereinbefore set forth. This portion of tape is then folded transversely by a rocking folder 45 and pushed between two folding-

rolls 46 47, the finished product of the machine being shown in Fig. 26.

The frame of the machine consists of two 70 side frames 48 48, supported upon a bed-plate 49, said bed-plate being fast to and supported by legs 50. The main driving-shaft 51 is rotated by a pulley 52 and has a hand-wheel 53 fast thereto, which acts as a balance-wheel and affords means by which the machine may be operated by hand. The 75 endless belt 32 passes partly around a grooved pulley 54, a pulley 55, and intermediate pulley 56. The pulley 54 is fast to a shaft 57, which rotates in bearings 58 upon the bed-plate 49, and is driven by a gear 59, fast to said shaft 57 and meshing into a pinion 60, 80 fast to the main driving-shaft 51. The endless belt 33 passes partly around pulleys 61, 62, and 56 and is held against the endless belt 32 and the tape 30 thereon by the relative position of the pulleys 56 and 61 to the pulley 54 and by an idler-pulley 64. Motion 85 is imparted to the endless belt 33 in the direction of the arrow, Fig. 4, by a gear 65, fast to a shaft 66, to which the pulley 56 is also fastened, said shaft rotating in bearings 67 upon the frame 48. The gear 65 meshes into a gear 68, fast to the shaft 57, said shaft, 90 as hereinbefore set forth, being rotated by a gear 59, which meshes into the pinion-gear 60, fast to the main driving-shaft 51.

The strip of paper 36 is fed from the reel 37 through tension-rolls 69 by intermittent feed-rolls 70 71. The intermittent feed-roll 70 is fast to a shaft 72 and is rotated by a gear 73, fast to said shaft 72 and meshing into a gear 74, fast to the main driving-shaft 51. The feed-roll 71 is fast to a shaft 75 and is rotated 105 by a gear 76, fast to said shaft 75 and meshing into a gear 77, fast to the shaft 72. The periphery of the feed-roll 70 is raised throughout a portion thereof to intermittently feed the paper strip 36 between said raised portion and the periphery of the feed-roll 71. 110 The paper strip is fed by said feed-rolls through a guide-slot 78 between the tape 30 and the endless belt 32, and at the proper time a portion of said paper is severed from the main strip 36 by a rocking cutter 38, which coöperates with the stationary cutter 39 to sever a portion of the paper from the main strip. The cutter 38, Figs. 1, 2, 4, and 11, is fast to a rocking lever 79, said rock- 120 lever 79 being arranged to rock loosely upon a shaft 80 and having a rocking motion imparted thereto by a sliding forked connection 81, pivotally connected at 82 to said cutter rock-lever 79 and having a cam-roll 83 jour- 125 naled thereon and engaging a cam 84, fast to the shaft 75. The forked connection 81 is provided with a slot 85, which embraces the shaft 75 and assists in guiding said forked connection as the same is reciprocated by the cam-roll 83 and cam 84, and thus imparts a 130 rocking motion to the lever 79.

The tape 30 passes over a guide-pulley 86 and is forced by an idler-roll 87 against the

endless belt 32, which runs in a groove 88, formed in the periphery of the pulley 54. The width of the strip of paper is about three times the width of the tape 30, said tape as it passes around the pulley 54 having one face thereof adjacent to the endless belt 32 and in line therewith. The central part of the portion of paper 89 which has been severed from the main strip, said paper portion constituting a wrapper, is guided centrally between the tape 30 and the endless belt 32, Fig. 17, and is carried by said endless belt and tape to the stationary folder 41 and to the paste-wheel 40. The paste-wheel 40 is located at one side of the groove 88 and the stationary folder 41 upon the opposite side of said groove. Paste is applied by the paste-wheel 40, as hereinafter described, to one side of the wrapper 89, and simultaneously therewith the other side of the wrapper 89 is folded lengthwise thereof by the stationary folder 41, as shown in Figs. 18, 19, and 20. As soon as the unpasted side of the wrapper is folded, as hereinbefore set forth, the pasted side encounters the stationary folder 42, and said pasted side is then folded across the tape lengthwise thereof and upon the unpasted side of the wrapper, as shown in Figs. 22, 23, 24, and 25. The paper then having been folded longitudinally is carried between the two endless belts 32 and 33 and partly around the pulleys 54 and 56 to the rotary cutter 35, as hereinbefore set forth. The paste is applied to the paper wrappers by a paste-wheel 40, said paste-wheel having teeth 90 of any desirable shape and size upon the periphery thereof and being fastened to a shaft 91, journaled to rotate in bearings 92, formed upon the paste-receptacle 93.

The paste-receptacle 93 is arranged to slide in ways 94, formed upon the under side of the bed-plate 49, and has a reciprocatory motion imparted thereto by a cam-lever 95, pivoted to rock upon the shaft 80 and provided with a slot 96, which engages the shaft 91, and having a rocking motion imparted thereto by a cam-roll 97, which engages an open cam 98, formed upon one end of the paper-feed roll 71. As the wrapper 89 is being carried forward in the direction of the arrow *a*, Fig. 4, between the tape 30 and the endless belt 32, as hereinbefore described, the paste-receptacle 93, together with the paste-wheel 40, is brought forward until the teeth 90 upon the paste-wheel contact with said wrapper 89, thus applying paste thereto.

The paste-wheel shaft 91 has a frictional roll 99 fast thereto, which contacts with the periphery of the grooved pulley 54 and is rotated thereby in the direction of the arrow, Fig. 7.

The stationary folder 41 is supported upon a bracket 100 and consists of a plate 101, having a warped surface 102, adapted to engage one side of the wrapper 89 and fold the same, as illustrated in Figs. 18 to 21, inclusive. Said warped surface 102 consists, substan-

tially, of a concave cone forming practically a quarter-circle at the entrance, Fig. 19, and gradually decreasing, as shown in Fig. 20, until it disappears entirely and becomes a flat folding-plate 103, as shown in Fig. 21. A thin-pointed plow-point 104 is fastened to the plate 101 and projects upwardly and in advance thereof, the point projecting into a narrow groove 105, provided in the pulley 54, so that when the left-hand side of the wrapper 89, Fig. 17, first encounters said plow-point it will turn it downwardly, as shown in Fig. 18. The left-hand side of the wrapper 89 is held slightly away from the surface of the grooved pulley by the construction and depth of the groove 88 with relation to the tape 30 and endless belt 32, said groove 88 being of such a depth that when the wrapper is forced by the tape and belt, as shown in Fig. 17, into the groove 88 it will descend part way into said groove, and the corner 106 of said groove will force the left-hand portion of the wrapper 89 slightly downward to a sufficient extent for the plow-point to enter thereunder, as shown in Fig. 18, and commence the folding operation of that side of the wrapper. The right-hand side of the wrapper 89 is prevented from being drawn downwardly by the corner 107 until it reaches the paste-wheel 40 by a flat spring 108, Fig. 4. After said right-hand side of the wrapper passes the paste-wheel it springs away from the grooved pulley 54, as shown in Fig. 18, and then encounters the plow-point 109 upon the stationary folder 42, as shown in Fig. 22. The right-hand side of the wrapper 89 is then folded by the warped surface 110 upon the plate 111, finally being folded flat across the tape and against the unpasted side of the wrapper, and thus held by a flat spring 112 until it passes between the endless belts 32 and 33. The plow-point 109 projects into a groove 113, formed in the periphery of the pulley 54, and the whole folder 42 is supported upon a bracket 114. The folders 41 and 42 are substantially alike in operation except that one is a right-hand and the other a left-hand construction. The paper now having been folded around the tape, it is carried between the endless belts 32 and 33, as hereinbefore set forth, to a sufficient distance to allow the paste to "set" and firmly hold the two sides of the paper together. The tape passes from between the two endless belts down the inclines 43 and 44 across the path of the rotary cutter 35, where a portion of the tape is severed from the main strip between two of the folded wrappers 89.

The cutter 35, Figs. 1, 3, 4, and 11, is fast to a shaft 115, which is rotated in a bracket 116 by a bevel-gear 117, which meshes into a bevel-gear 118, fast to a shaft 119, which is rotated in the bracket 116 and has fastened to the lower end thereof a bevel-gear 120, which meshes into a bevel-gear 121, fast to a shaft 122, which turns in bearings upon the frame of the machine and has fast thereto a sprocket-

gear 123 and is rotated in the direction of the arrow *b*, Fig. 11, by a sprocket-chain 124, connecting said sprocket-gear 123 to a sprocket-gear 125, fast to the shaft 72 and rotated as hereinbefore described.

It will be seen that the mechanism for cutting off the portions of paper from the paper strip is connected by the gearing hereinbefore described with the rotary cutter for severing portions of the tape from the main strip of said tape, and therefore that the relative time of cutting the paper may be adjusted to the time at which the rotary cutter severs the tape by loosening the set-screw 126, Fig. 11, and turning the cutter 35, together with the shaft 115, to any desired angle and position with relation to the bevel-gear 117, and hence with relation to the cutter 38, and the set-screw 126 is then tightened to lock the bevel-gear 117 to the shaft 115. The adjustment of the "time of cut" of the tape with relation to that of the paper may be obtained in a variety of ways without departing from the spirit of our invention. The gearing for operating both cutters being connected, it is evident that to change any of the gears with relation to the shafts to which said gears are fastened would secure the result hereinbefore described in relation to the set-screw 126. In order to adjust the cutting edge of the stationary cutter 39 with relation to that of the rocking cutter 38, said cutter 39 is pivoted upon the pointed screws 127, Figs. 11 and 12, screw-threaded into a supporting-frame 128, said frame being supported upon the shafts 72 and 75 and provided with a slot 78 to guide the paper strip 36. The cutter 39 is pressed downwardly, Fig. 11, by two spiral compression-springs 130, held in holes formed in the supporting-frame 128 and bearing against the upper face of said stationary cutter, and is adjusted upwardly by means of an adjusting-screw 131, fitted to turn in a hole in the supporting-frame 128 and having screw-threaded engagement with the cutter 39. Thus by turning the adjusting-screw 131 to the right the stationary cutter 39 is raised, and by turning it to the left it is carried down by the spiral springs 130. The tape, as hereinbefore described, is fed down the inclines 43 and 44 to the position shown in Fig. 14, and just as a portion of said tape, forming one strap 132, is severed from the main portion by the rotary cutter 35 said strap 132 is taken by the rocking lever 45, as shown in Fig. 14, and pushed through a slot 133, provided in the guide-plate 134, doubling the strap, as shown in Fig. 15, and carrying the folded portion thereof between the two folding-rolls 46 and 47. The folding-roll 46 is preferably covered with a sleeve 135 of a yielding substance, such as rubber.

The rocking folder 45 is pivoted upon a stud 136, fast to an adjustable frame 137, pivoted upon the shaft 57. Said rocking folder has an arm 138, fast thereto, pivotally con-

nected to an adjustable sliding forked connection 139. Said connection is slotted at 140 to embrace the shaft 122, upon which it slides, a reciprocatory movement being imparted to said connection by a cam 141, which engages a cam-roll 142, journaled upon said connection 139. The connection 139 is made in two parts provided with right and left hand threads and engaging the right and left hand nut 143, and thus by turning said nut in one direction or the other the location of the folder 45 with relation to the strap 132 which is to be folded may be regulated.

The rolls 46 and 47 are fast to the shafts 144 and 145, respectively, said shafts turning in bearings in the adjustable frame 137 and connected to rotate together by gears 146 and 147, respectively, the shaft 145 having the gear 147 fast thereto, and the shaft 144 having the gear 146 fast thereto. The shaft 145 has in addition a gear 148 fast thereto and meshing into an intermediate gear 149, which rotates upon a stud 150, fast to the frame 137, and meshes into another intermediate gear 151, which rotates upon a stud 152, fast to the frame 137, said gear 151 in turn meshing into the gear 59.

It is desirable in a machine of this class that straps of different lengths should be cut from the tape, and to accomplish this result the gears 73 and 74 are changed for other gears the sum of whose diameters is the same as that of the gears 73 and 74. For instance, if it is desired to feed a longer strap at each rotation the gear 74 is removed and a larger gear substituted in its place, while the gear 73 is removed and a smaller gear substituted in its place, the sum of the diameters of the two gears substituted for 73 and 74 being the same as the sum of the diameters of the gears 73 and 74. If it is desired to feed a shorter strap, a smaller gear is substituted in the place of 74 and a larger gear in the place of 73, and thus any desired length of strap may be obtained. It will be seen that when the length of strap is changed the point at which said strap is severed from the main strip of tape remaining the same the folding-rolls 46 and 47 must be raised or lowered, according as the strap is shortened or lengthened, respectively, so as to bring the fold of the strap midway between the two ends thereof, and this is obtained by raising and lowering the adjustable frame 137 upon its pivotal shaft 57.

The frame 137 is raised and lowered, respectively, by means of two adjusting-screws 153 and 154, Fig. 3. The screw 153 is screw-threaded into the bed-plate 49. The adjusting-screw 154 is screw-threaded in an ear 155, fast to said bed-plate. Both of said adjusting-screws engage an ear 156 upon the adjustable frame 137, and by adjusting the said screws it will be evident that the frame 137 will be raised or lowered and locked in position thereby, thus bringing the point of the rocking folder into the proper location to fold the strap in the center thereof between the

ends and at the same time keeping the working parts of the folding mechanism in the same relation with relation to each other, as all of said working parts are supported upon the adjustable frame 137—viz., the rocking folder 45, the folding-rolls 46 and 47, the guide-plate 134, and gears 149 and 151.

It is evidently very essential that the rotary cutter 35 should cut the tape between two of the portions of paper folded thereon. As hereinbefore described, any inaccuracy in the time of cut may be adjusted by means of the set-screw 126. Another means of compensating for any inaccuracy in the point at which the rotary cutter severs the tape consists in disconnecting the gear 74 from the shaft 51 and then rotating said shaft by the hand-wheel 53 until the tape is carried by the endless belts to a position in which the rotary cutter 35 is midway between the folded wrappers. This disconnection of the gear 74 from the main shaft is obtained by the means illustrated in Figs. 28 and 29, in which the gear 74 is loose upon the shaft 51, said shaft 51 having a ratchet 166, fast thereto, and a pawl 167, fast to the face of the gear 74. When it is desired to disconnect said gear from the shaft, the pawl 167 thereon is turned over into the position shown in dotted lines, Fig. 29, and rests against the pin 168. Now upon rotating the shaft 51 by means of the hand-wheel 53 it is evident that the grooved pulley 54 will be rotated by means of the gear 59 and the pinion-gear 60, which meshes said gear 59 and is fast to the shaft 51, and thus that the endless belts, as hereinbefore described, will be moved and the tape brought to any desired position with relation to the rotary cutter without actuating the paper-feed mechanism or the cutting mechanisms, said mechanisms being, as hereinbefore described, driven primarily by the gear 74, fast to the shaft 51.

In order to adapt the grooved pulley 54 to feed varying widths of tape, the flange, Fig. 27, of the grooved pulley 54 is made in two parts 169 170, screw-threaded together, as shown. When it is desired to change the width of the groove, the part 170 is turned upon the part 169 in the proper direction to widen or narrow said groove, and the parts are then locked together by a set-screw or in any desirable manner.

The object of constructing the paste-wheel 40 with teeth 90 is in order that a continuous strip of paste may not be laid upon the paper, it having been found by practice that too much paste would thus be laid upon the paper and when folded and pressed, as hereinbefore described, be squeezed out from between the paper and lead to undesirable and imperfect results. By providing the periphery of the paste-wheel with teeth the paste is laid on in a series of dots, and when the pressure of folding one of the sides of paper upon the other side is applied these small dots of paste are pressed outwardly and practically

do make a continuous strip after the pressure has been applied, as hereinbefore set forth.

In Figs. 5 and 6 I have illustrated in detail an improved tension-regulating device whereby the tension upon the tape 30 may be increased or diminished and the feed of the tape regulated to a certain extent. It is evident that it is very necessary that the rotary cutter 35 should sever the tape between two of the wrappers folded upon said tape, and by this regulating device, together with the tape-feed-adjusting mechanism hereinbefore described, we are enabled to accomplish this result with nicety.

The tension-regulating device consists of a plate 157, located in a groove 158, formed in the upper side of a bracket 159, fast to a standard 160, supported upon and fast to the bed-plate 49. The tension-plate 157 has a pin 161 riveted thereto, which extends upwardly through a chamber 162, formed in the bracket 159 and through a hole formed in the adjusting-screw 163, said screw having screw-threaded engagement with the bracket 159 and being locked in position thereon by a set-nut 164. A spiral compression-spring 165, located in the chamber 162, bears at one end against the adjusting-screw 163 and at the lower end against the tension-plate 157. When it is desired to increase the tension upon the tape 30, the set-nut 164 is loosened and the screw 163 turned in the proper direction to compress the spring 165, and thus increase the tension, the set-nut 164 being finally set up to hold the screw 163 in position. When it is desired to remove the tension from the tape 30, the tension-plate 157 is raised, by means of the upper end of the pin 161, and turned at right angles to the position shown in Fig. 6 to the position shown in dotted lines therein.

Having thus described our invention, what we claim, and desire by Letters Patent to secure, is—

1. In a machine for covering straps, mechanism to impart a continuous feeding movement to a strip of tape, mechanism to intermittently feed a strip of paper lengthwise of said tape, mechanism to sever portions of predetermined length from said strip of paper, and means to fold said portions of paper around said tape.

2. In a machine for covering straps, mechanism to impart a continuous feeding movement to a strip of tape, mechanism to feed a strip of paper to said tape lengthwise thereof, mechanism to sever portions of predetermined length from said strip of paper, means to fold said portions of paper around said tape with two opposite sides of said paper in contact with each other, with a space between the adjacent ends of said portions of paper, and means adapted to travel longitudinally with said tape to hold said paper and tape in fixed relation to each other.

3. In a machine for covering straps, mechanism to impart a continuous feeding move-

ment to a strip of tape, mechanism to intermittently feed a strip of paper lengthwise of said tape, mechanism to sever portions of predetermined length from said strip of paper, means to fold said portions of paper around said tape, with a space between the adjacent ends of said portions of paper, and means adapted to travel longitudinally with said tape to hold said paper and tape in fixed relation to each other.

4. In a machine for covering straps, mechanism to impart a continuous feeding movement to a strip of tape, mechanism to feed a strip of paper to said tape lengthwise thereof, mechanism to sever portions of predetermined length from said strip of paper, means to fold said portions of paper around said tape, with two opposite sides of said paper in contact with each other, with a space between the adjacent ends of said portions of paper, means adapted to travel longitudinally with said tape to hold said paper and tape in fixed relation to each other, and mechanism to sever said tape into portions of a length greater than the length of said portions of paper.

5. In a machine for covering straps, mechanism to impart a continuous feeding movement to a strip of tape, mechanism to feed a strip of paper to said strip of tape lengthwise thereof, mechanism to sever portions of predetermined length from said strip of paper, means to fold said portions of paper around said tape, with two opposite sides of said paper in contact with each other, with a space between the adjacent ends of said portions of paper, means adapted to travel longitudinally with said tape to hold said paper and tape in fixed relation to each other, and mechanism to sever said tape between two of said folded portions of paper.

6. In a machine for covering straps, mechanism to impart a continuous feeding movement to a strip of tape, mechanism to feed a strip of paper to said tape lengthwise thereof, mechanism to sever portions of predetermined length from said strip of paper, means to fold said portions of paper around said tape, with the two opposite sides of said paper in contact with each other, with a space between the adjacent ends of said portions of paper, means adapted to travel longitudinally with said tape to hold said paper and tape in fixed relation to each other, mechanism to sever said tape between two of said folded portions of paper, and mechanism to double said severed portions of tape.

7. In a machine for covering straps, mechanism to impart a continuous feeding movement to a strip of tape, mechanism to feed a strip of paper to said tape lengthwise thereof, mechanism to sever portions of predetermined length from said strip of paper, means to apply paste to said portions of paper, means to fold said portions of paper around said tape, with two opposite sides of said paper in contact with each other, with a space between

the adjacent ends of said portions of paper, and means adapted to travel longitudinally with said tape to hold said paper and tape in fixed relation to each other.

8. In a machine for covering straps, mechanism to impart a continuous feeding movement to a strip of tape, mechanism to feed a strip of paper to said tape lengthwise thereof, mechanism to sever portions of predetermined length from said strip of paper, means to apply paste lengthwise and at one side of each of said portions of paper, means to fold the unpasted side of said portions of paper over said tape, means to fold the pasted side of said paper upon said unpasted side, with a space between the adjacent ends of said portions of paper, and means adapted to travel longitudinally with said tape to hold said paper and tape in fixed relation to each other.

9. In a machine for covering straps, mechanism to impart a continuous feeding movement to a strip of tape, mechanism to feed a strip of paper to said tape lengthwise thereof, mechanism to sever portions of predetermined length from said strip of paper, means to apply paste lengthwise and at one side of each of said portions of paper, means to fold the unpasted side of said portions of paper over said tape, means to fold the pasted side of said paper upon said unpasted side, with a space between the adjacent ends of said portions of paper, means adapted to travel longitudinally with said tape to hold said paper and tape in fixed relation to each other, until said paste is set.

10. In a machine for covering straps, a pulley provided with a groove, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said tape and pulley, and means to fold said portions of paper around said tape.

11. In a machine for covering straps, a pulley provided with a groove, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said tape and pulley, and means to apply paste lengthwise and at one side of each of said portions of paper.

12. In a machine for covering straps, a pulley provided with a groove, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said tape and pulley, means to apply paste lengthwise and at one side of each of said portions of paper, means to fold the unpasted side of said portions of paper over said tape, and means to fold the pasted side of said paper upon the said unpasted side.

13. In a machine for covering straps, a pulley provided with a groove, an endless belt located in said groove and extending partly around said pulley, a strip of tape extending

partly around said pulley with one face adjacent to and in line with said groove, and mechanism to feed portions of paper of predetermined length between said belt and tape.

5 14. In a machine for covering straps, a pulley provided with a groove, an endless belt located in said groove and extending partly around said pulley, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said belt and tape, and means to fold said portions of paper around said tape.

15 15. In a machine for covering straps, a pulley provided with a groove, an endless belt located in said groove and extending partly around said pulley, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said belt and tape, and means to apply paste lengthwise and at one side of said paper.

25 16. In a machine for covering straps, a pulley provided with a groove, an endless belt located in said groove and extending partly around said pulley, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said belt and tape, means to apply paste lengthwise and at one side of said paper, and means to fold the unpasted side of said paper upon said pasted side.

17. In a machine for covering straps, a pulley provided with a groove, an endless belt located in said groove and extending partly around said pulley, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said belt and tape, means to fold said portions of paper around said tape, and a second endless belt extending partly around said pulley and holding said tape and folded portions of paper against said first-named endless belt.

50 18. In a machine for covering straps, a pulley provided with a groove, an endless belt located in said groove and extending partly around said pulley, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said belt and tape, means to fold said portions of paper around said tape, a second endless belt extending partly around said pulley and holding said tape and folded portions of paper against said first-named endless belt, and means to apply paste lengthwise and at one side of each of said portions of paper.

65 19. In a machine for covering straps, a pulley provided with a groove, an endless belt

located in said groove, and extending partly around said pulley, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said belt and tape, means to apply paste lengthwise and at one side of each of said portions of paper, means to fold the unpasted side of said paper over said tape, means to fold the pasted side of said paper upon said unpasted side, and a second endless belt extending partly around said pulley and holding said tape and folded portions of paper against said first-named endless belt.

20. In a machine for covering straps a folder, consisting of a plate having a warped surface adapted to fold a portion of paper lengthwise thereof, and a flat plow-point of sheet metal fast to said folder and projecting above and in advance of said warped surface, said plow-point located in a plane substantially at right angles to the surface of the paper to be folded.

21. A machine for covering straps comprising a pulley provided with a groove, an endless belt located in said groove and extending partly around said pulley, a strip of tape extending partly around said pulley with one face adjacent to and in line with said groove, mechanism to feed portions of paper of predetermined length between said belt and tape, two stationary folders located upon opposite sides of said tape, one in advance of the other, and adapted to fold the opposite sides of each of said portions of paper consecutively lengthwise thereof and across said tape, and a second endless belt extending partly around said pulley and holding said tape and folded portions of paper against said last-named endless belt and acting as a means to feed said portions of paper past said folders.

22. In a machine for covering straps, mechanism to impart a continuous feeding movement to a strip of tape, mechanism to feed a strip of paper lengthwise of said tape, a cutting mechanism to sever portions of predetermined length from said strip of paper, means to fold said portions of paper around said tape, a cutting mechanism to sever said tape between two of said folded portions of paper, and means to alter the time of cut of one of said cutting mechanisms with relation to the other, and thus cut said tape at a predetermined point between said folded portions of paper.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

HENRY R. CHADBOURNE, JR.

ISAAC S. CRAIG.

CHARLES W. B. FULLER.

Witnesses:

CHARLES S. GOODING,

ANNIE J. DAILEY.