No. 671,005. Patented Apr. 2, 1901.

W. S. SHERMAN.

LABEL ATTACHING MACHINE.

(Application filed Dec. 10, 1897. Renewed Sept. 10, 1900.)

(No Model.) 16 Sheets—Sheet 1.

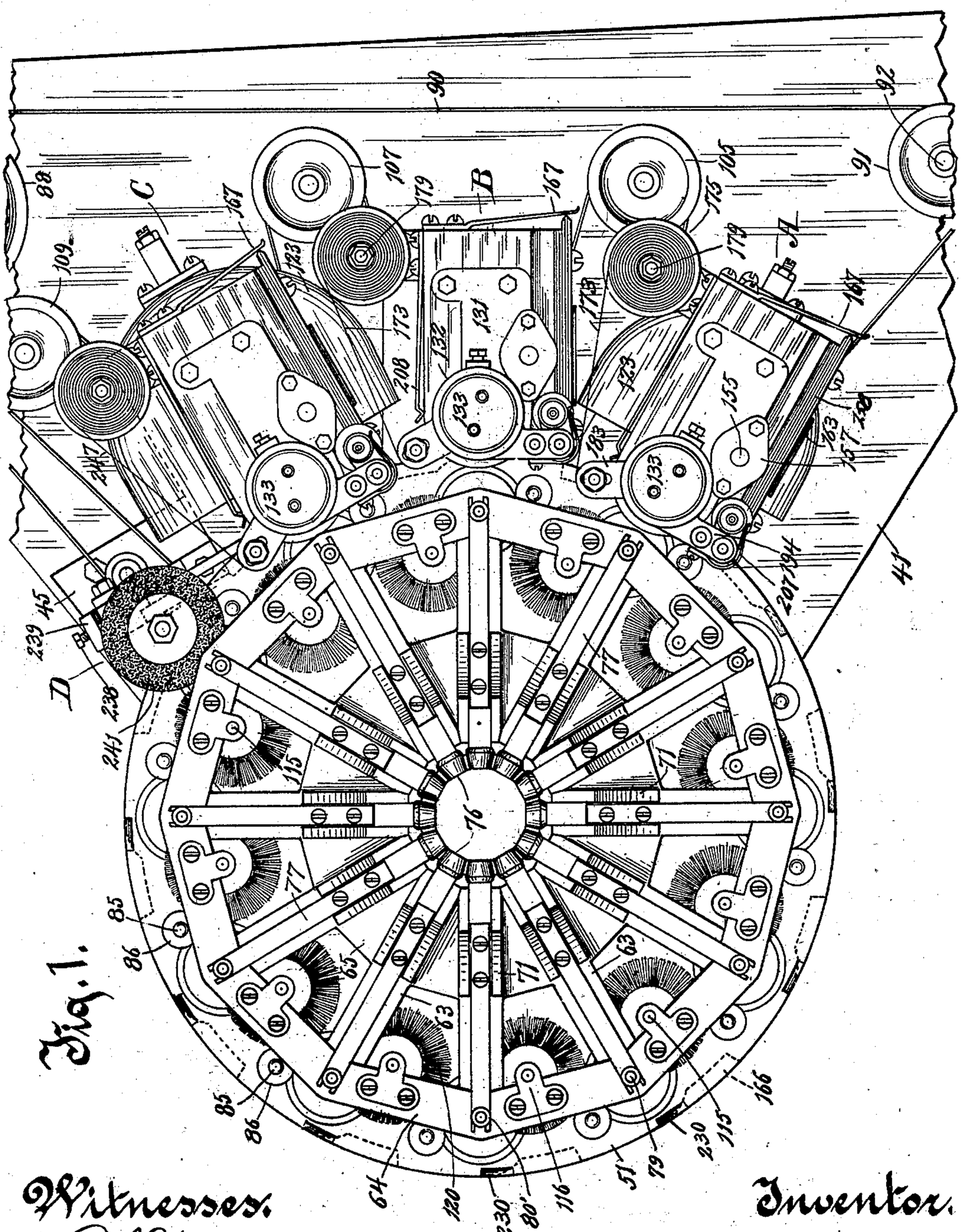

Fig. 1.

Witnesses:
C. A. Keeney.
Anna V. Faust.

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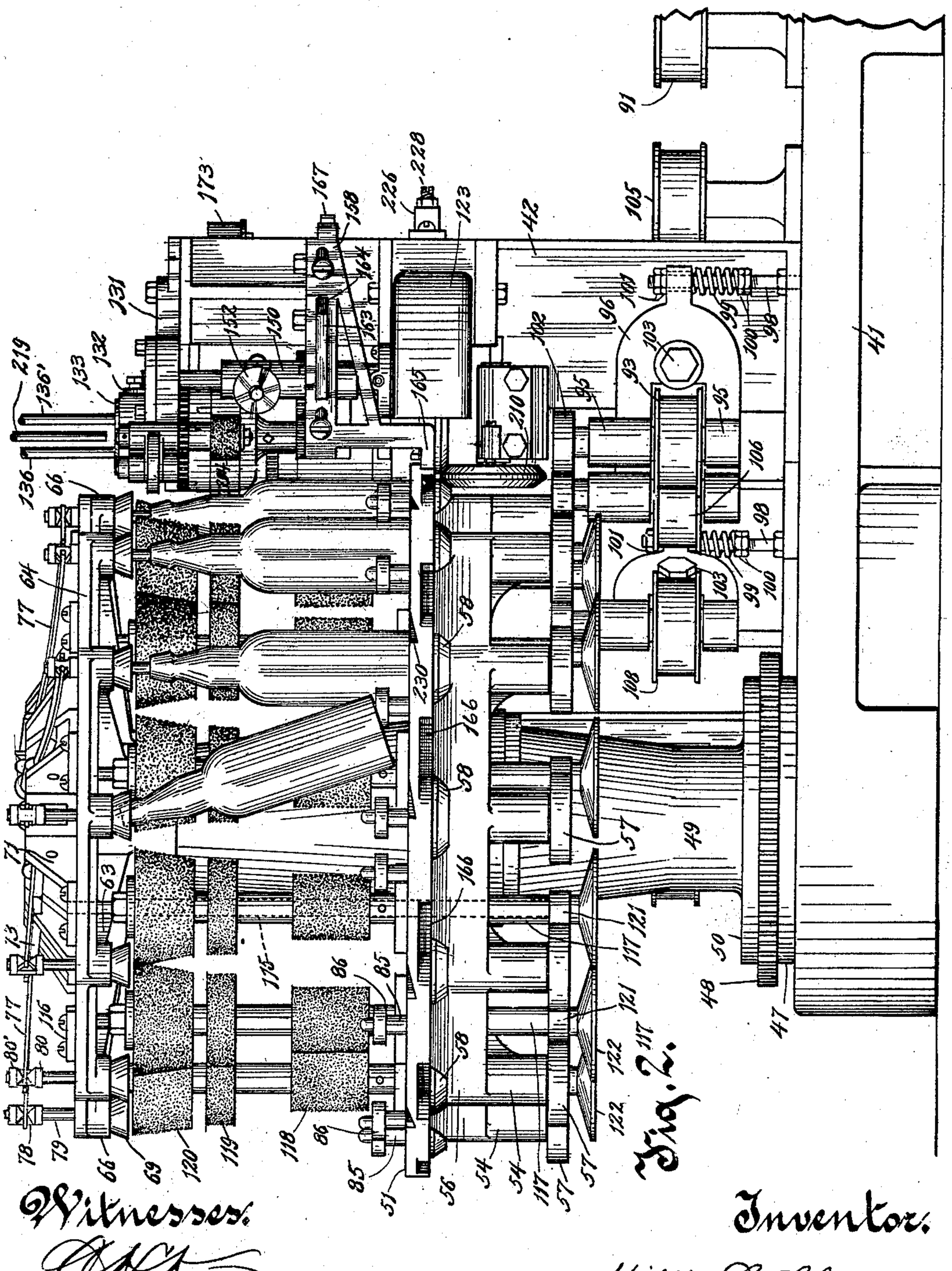

Fig. 2.

Witnesses:
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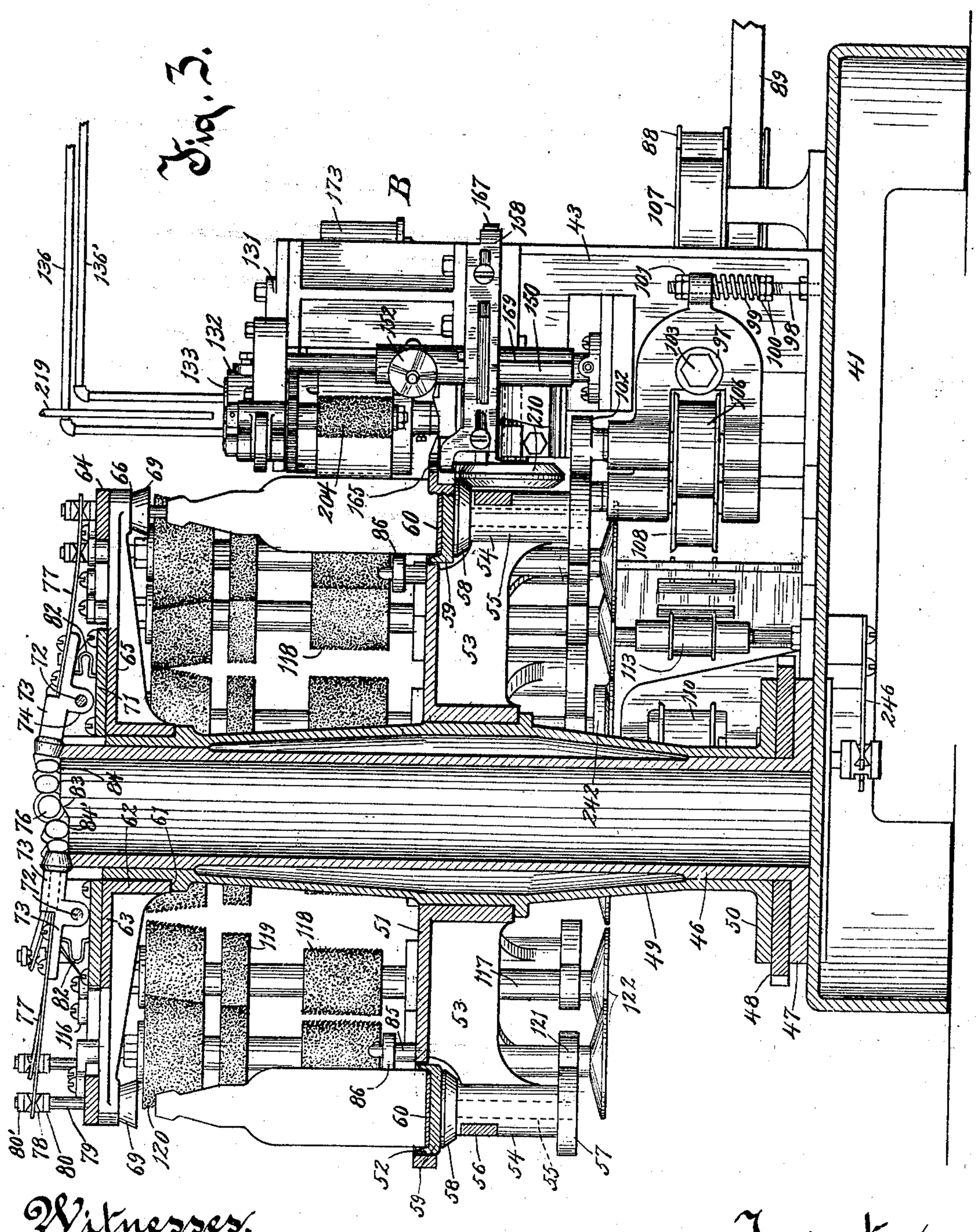
16 Sheets—Sheet 3.

Fig. 3.



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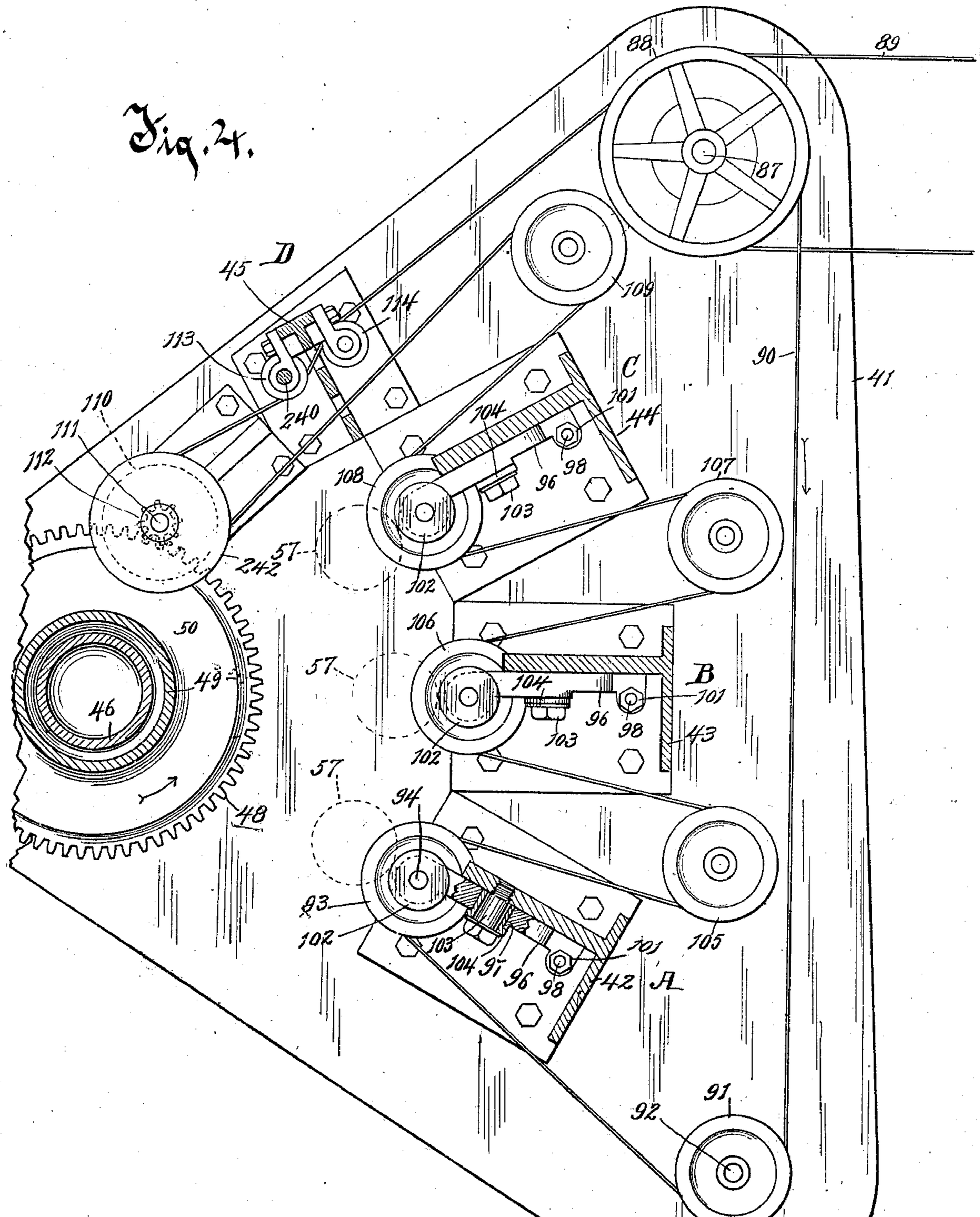
16 Sheets—Sheet 4.

Fig. 24.



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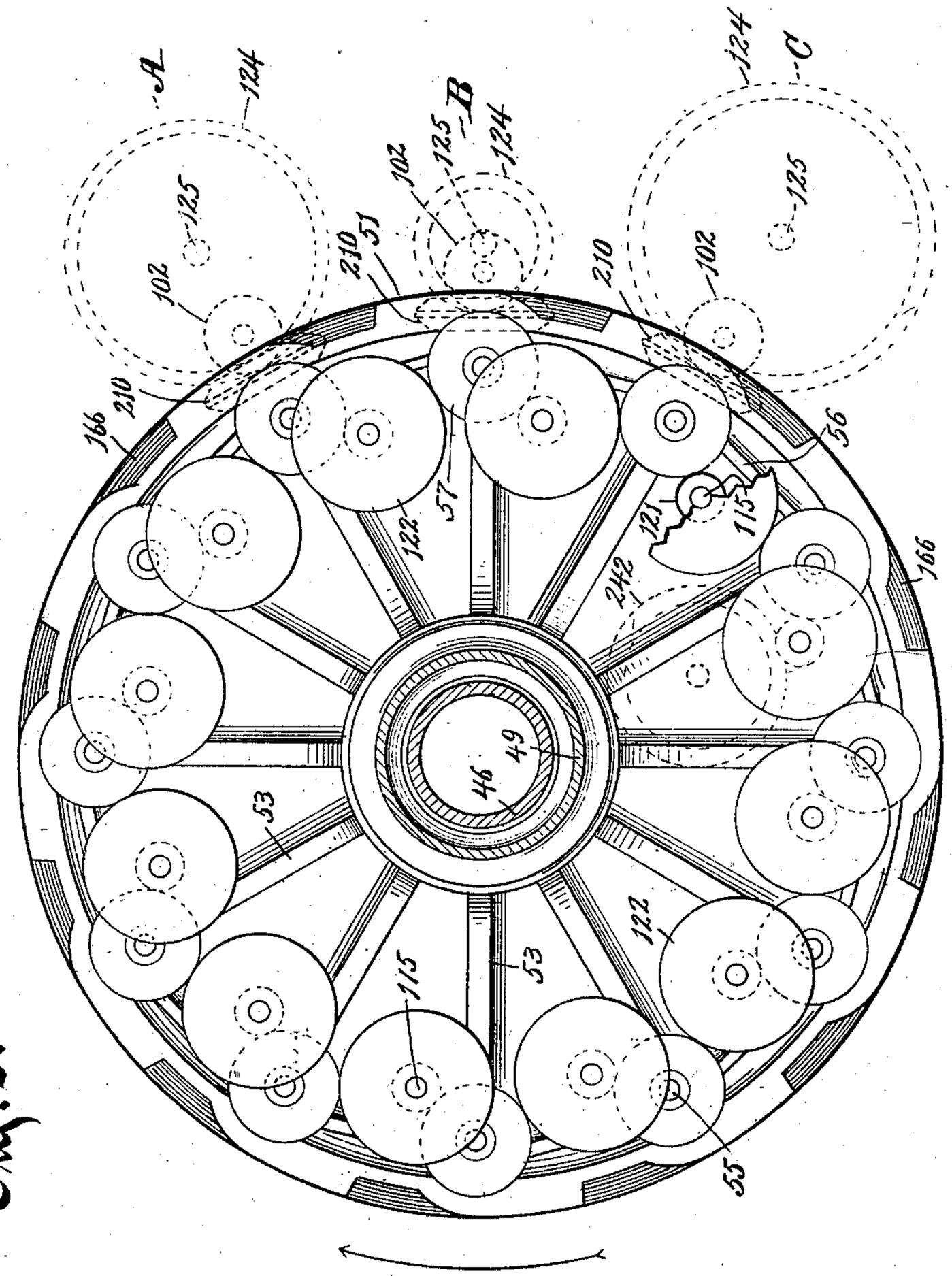

Fig. 5.

Witnesses.
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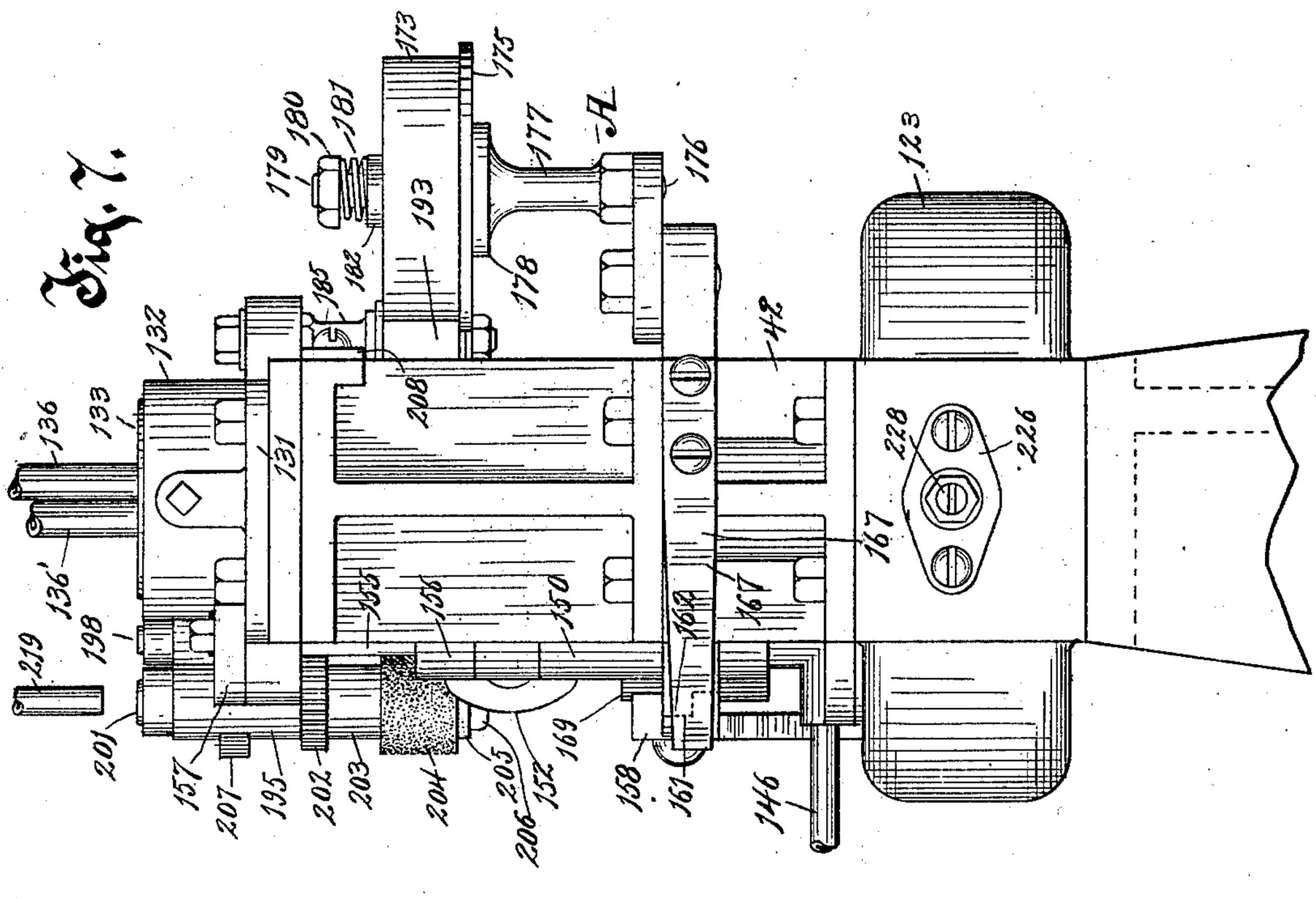
Fig. 7.



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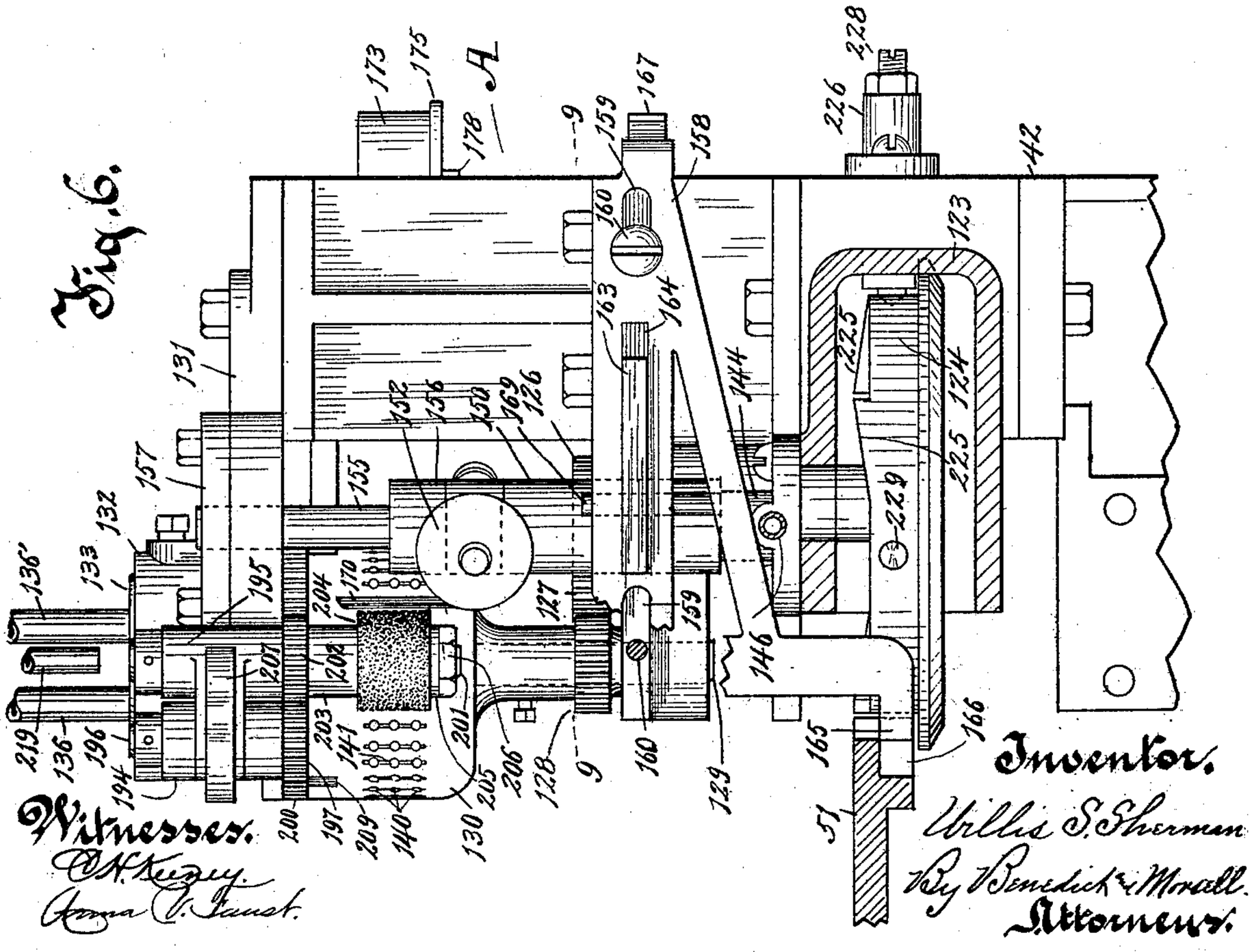

Witnesses.
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Fig. 8.

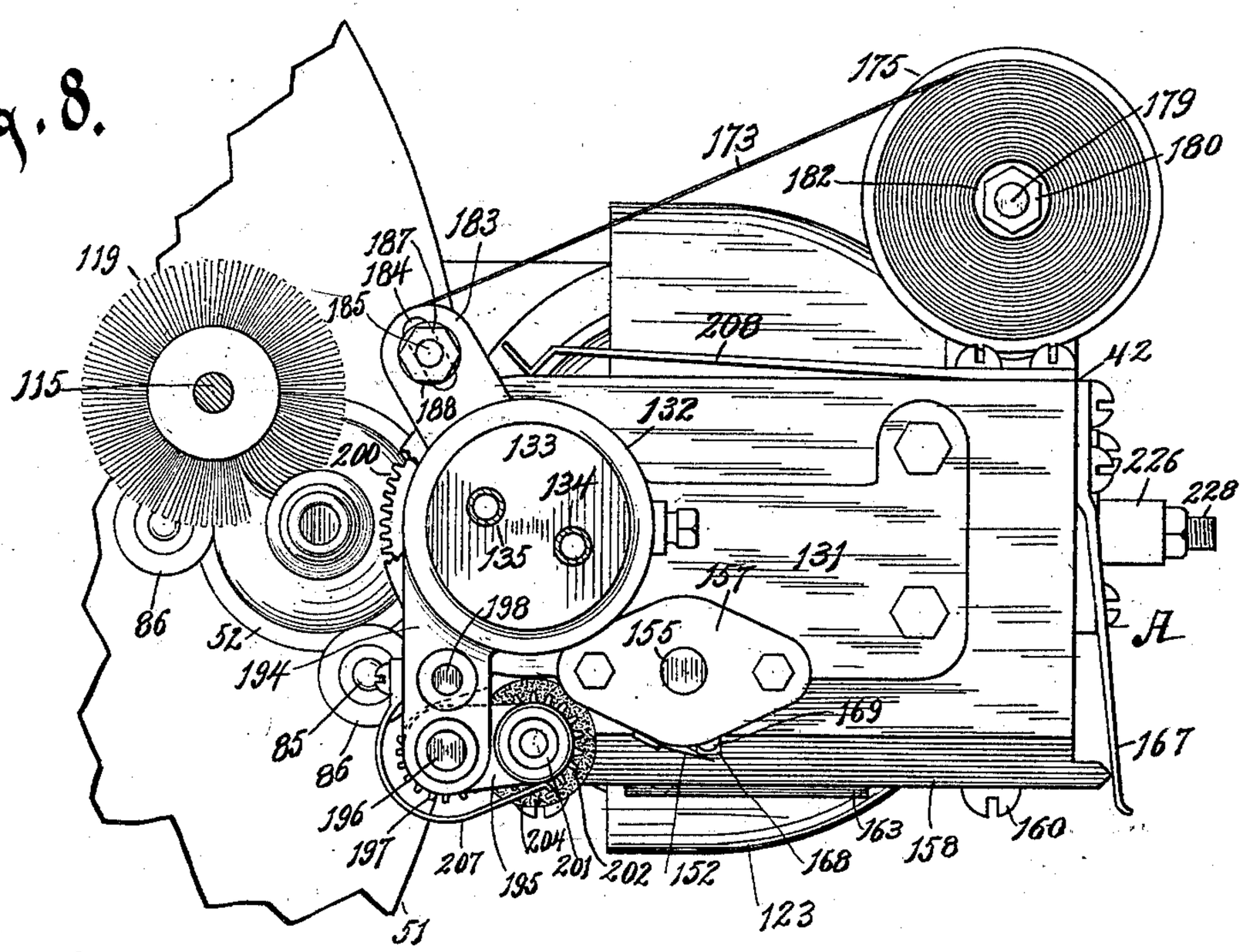
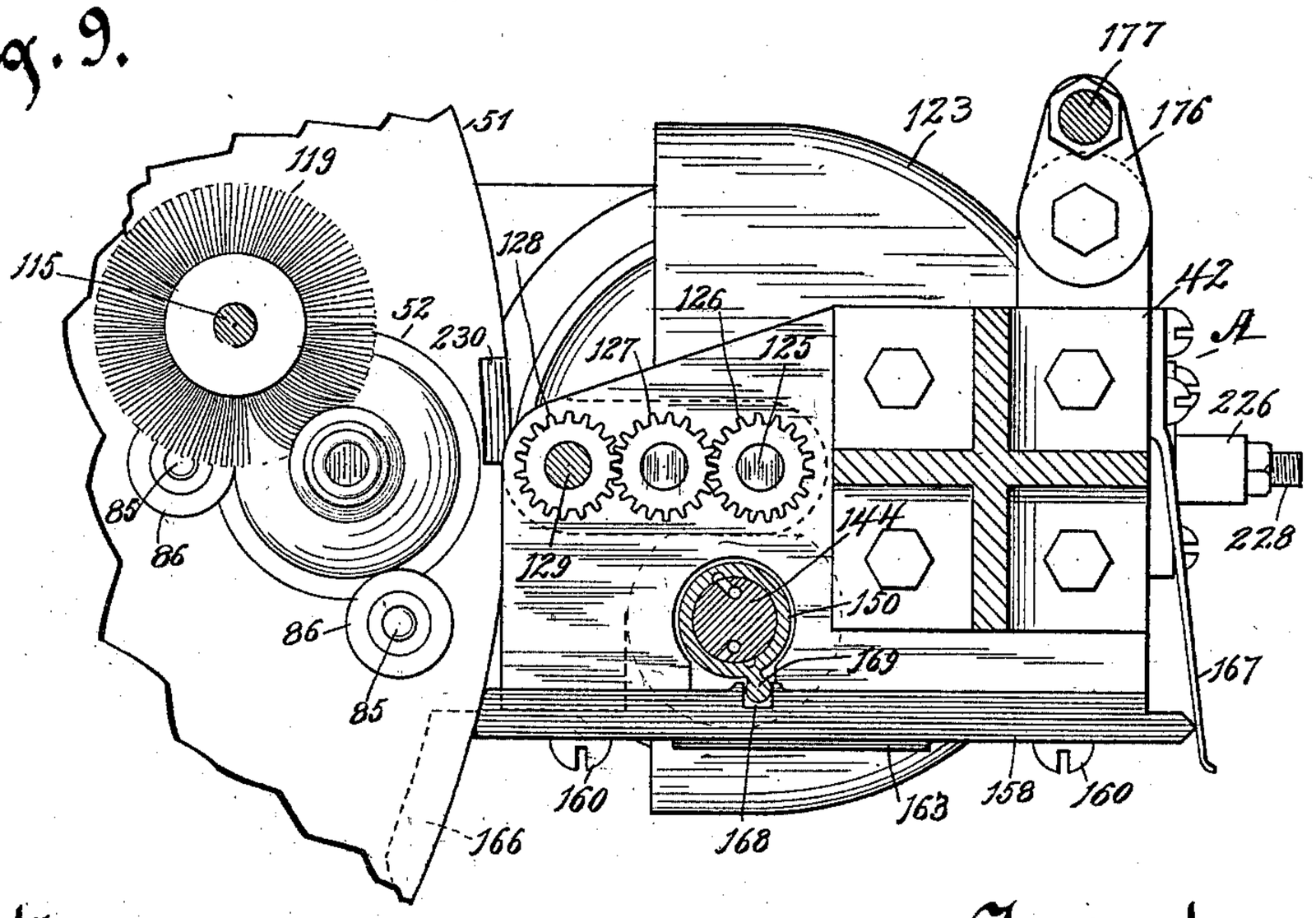


Fig. 9.



Witnesses.

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Fig. 11.

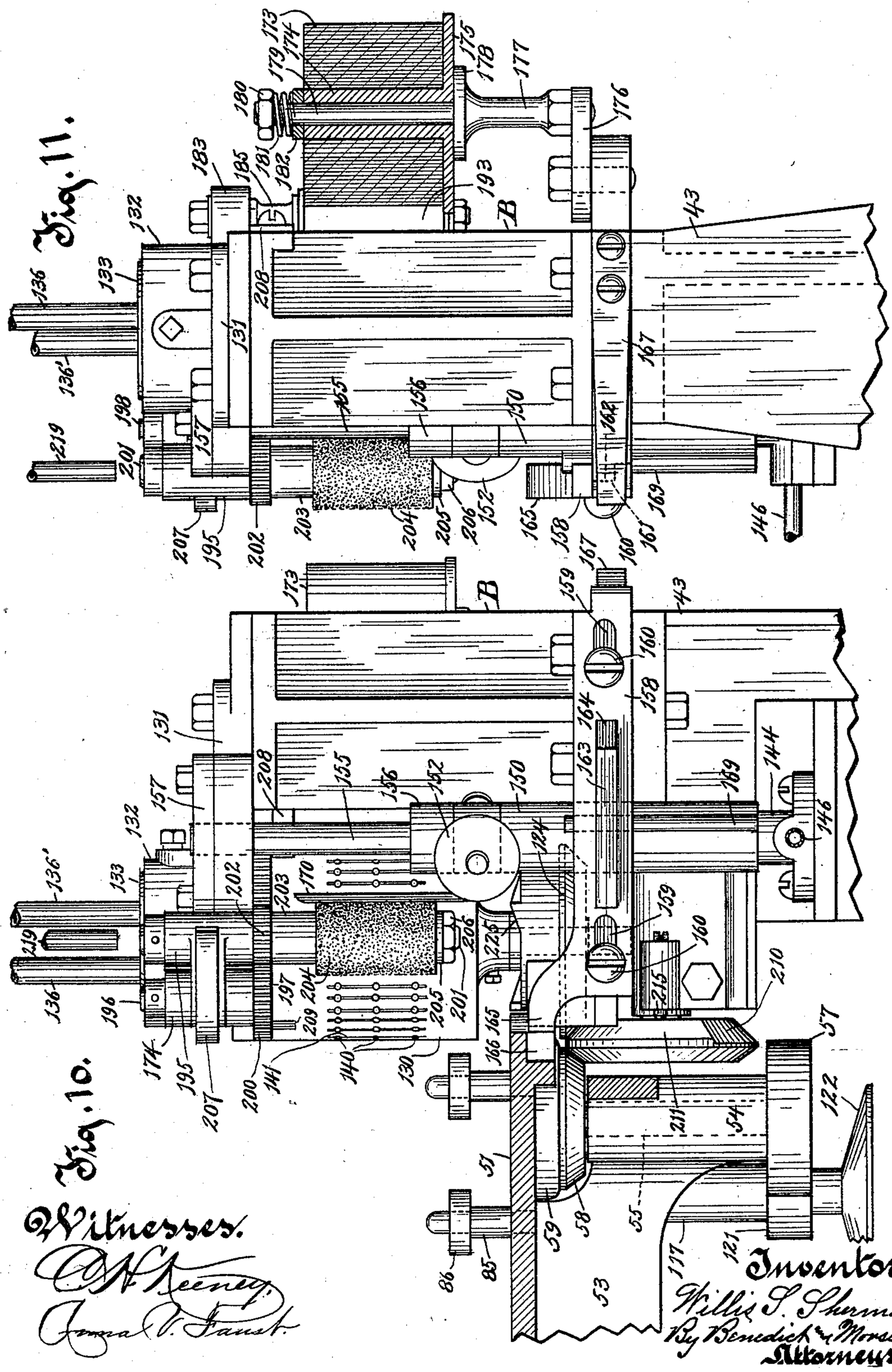

Fig. 10.

Witnesses.
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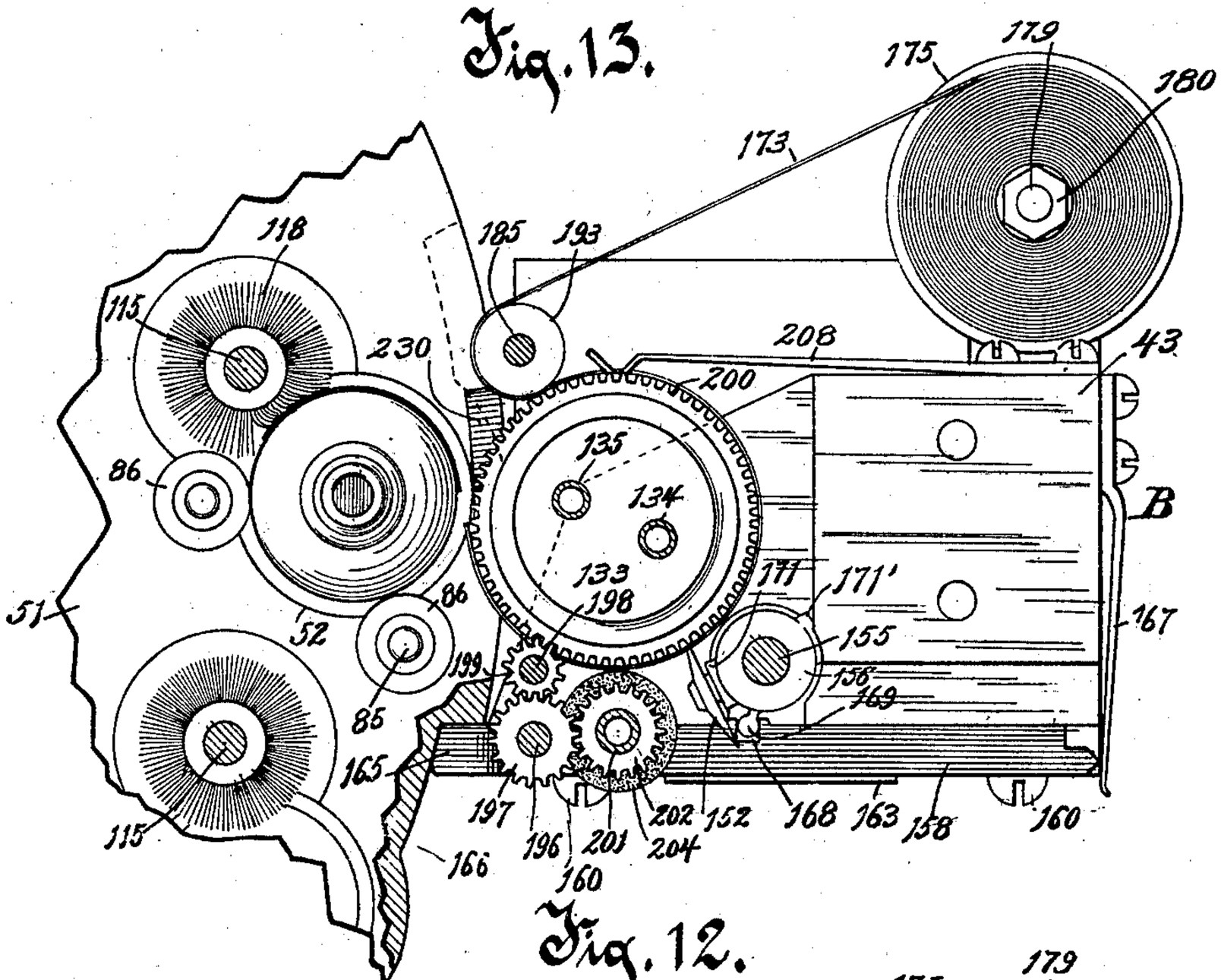
Fig. 13.



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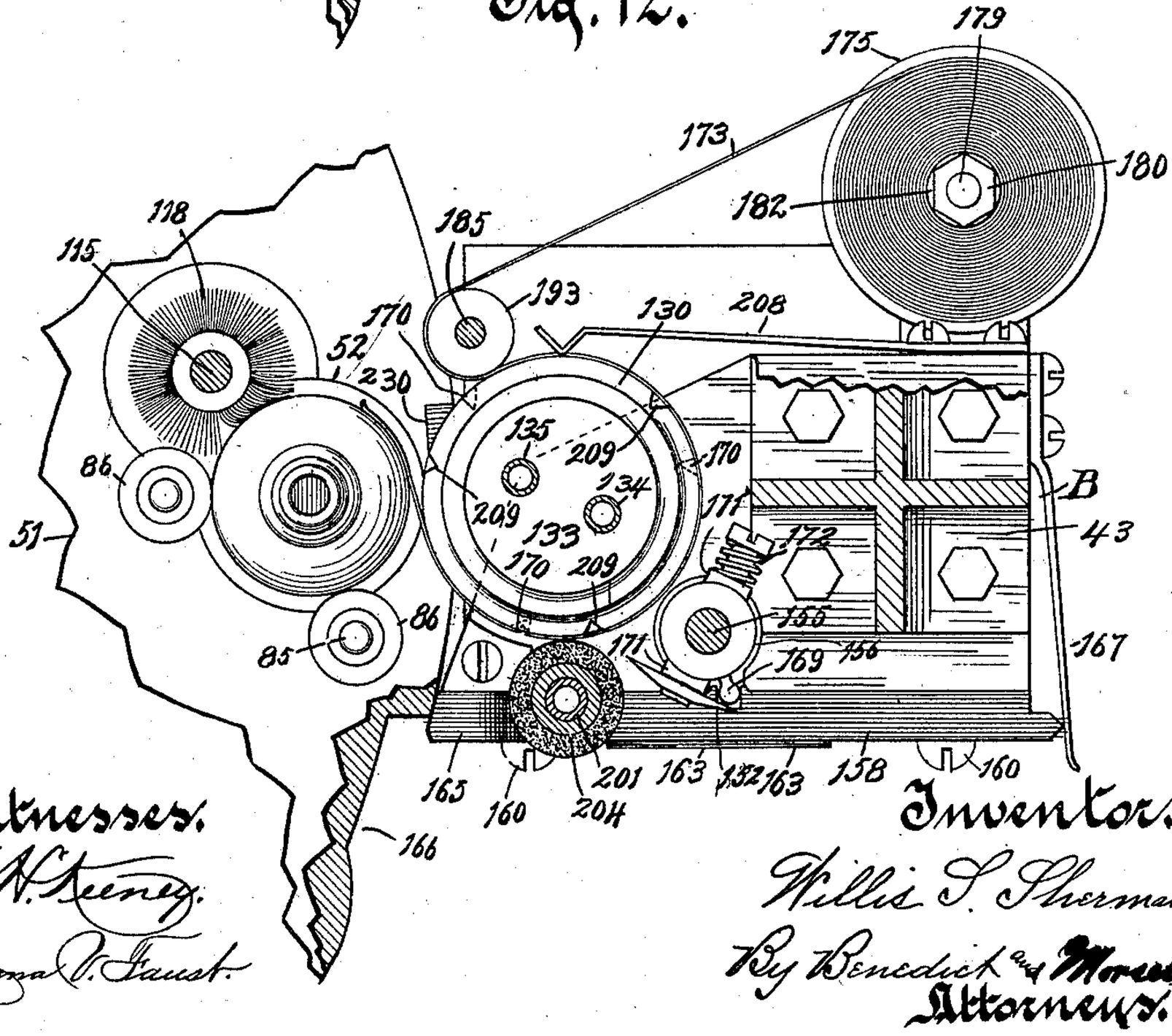

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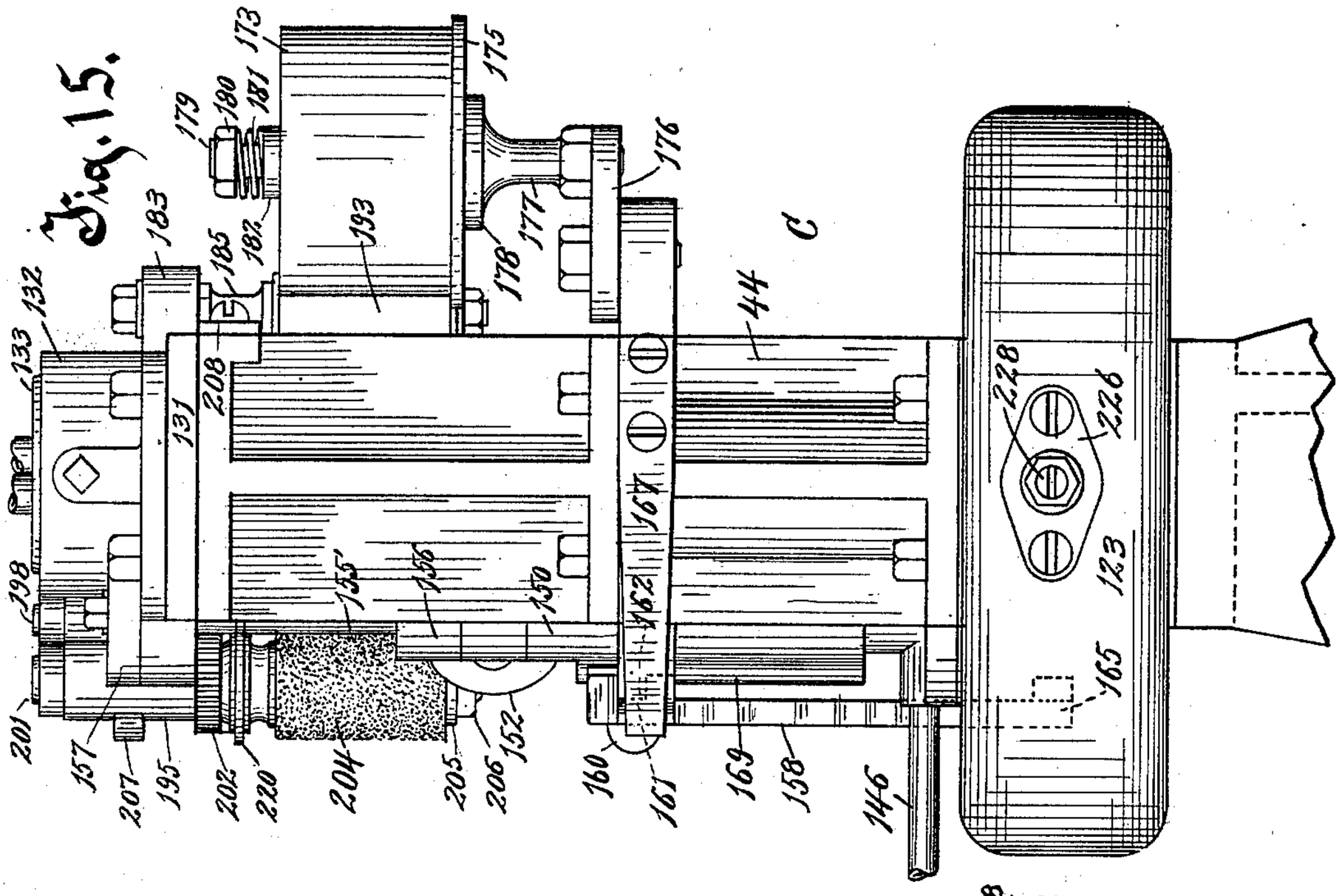
Fig. 13.



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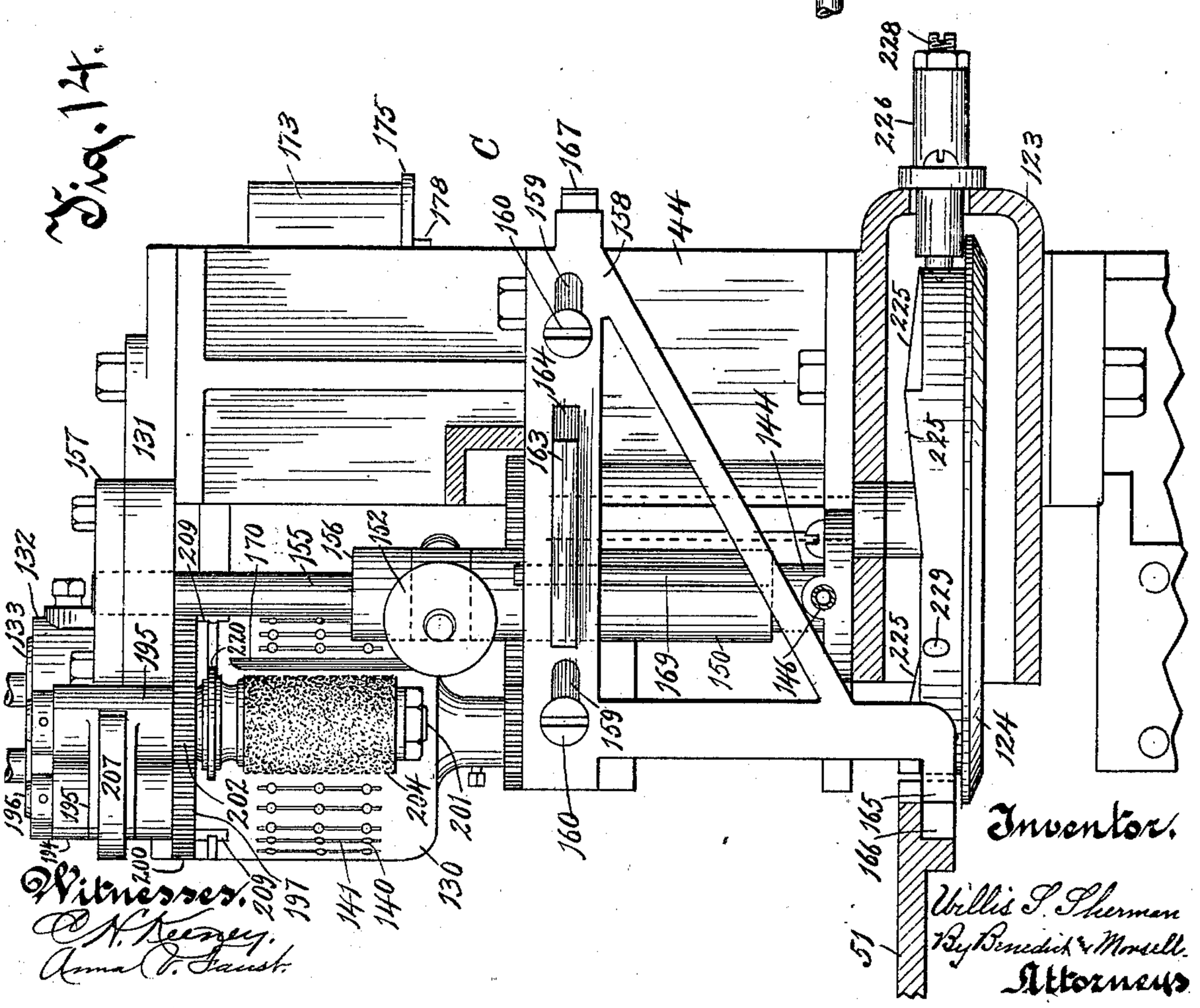

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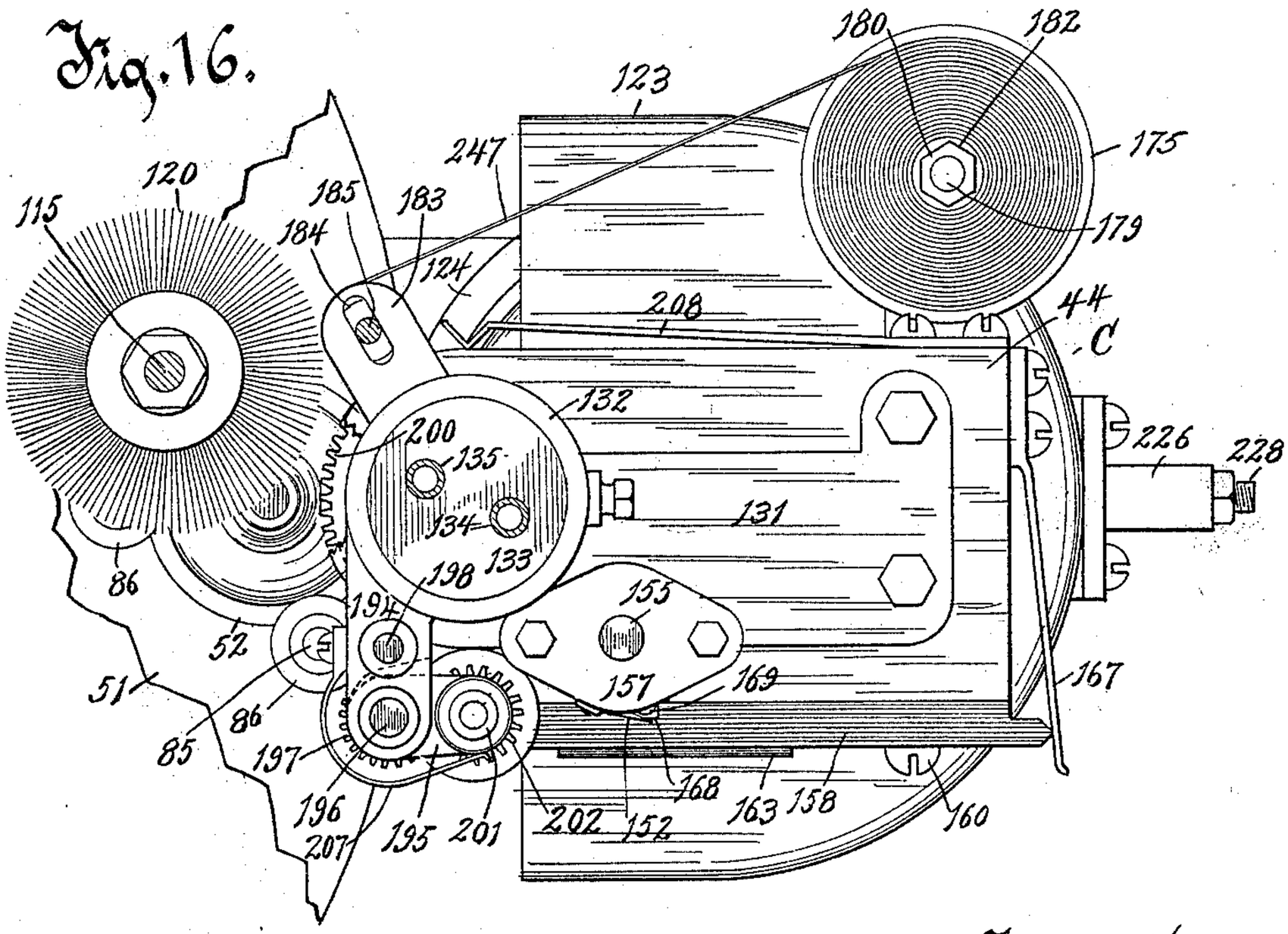
Fig. 16.



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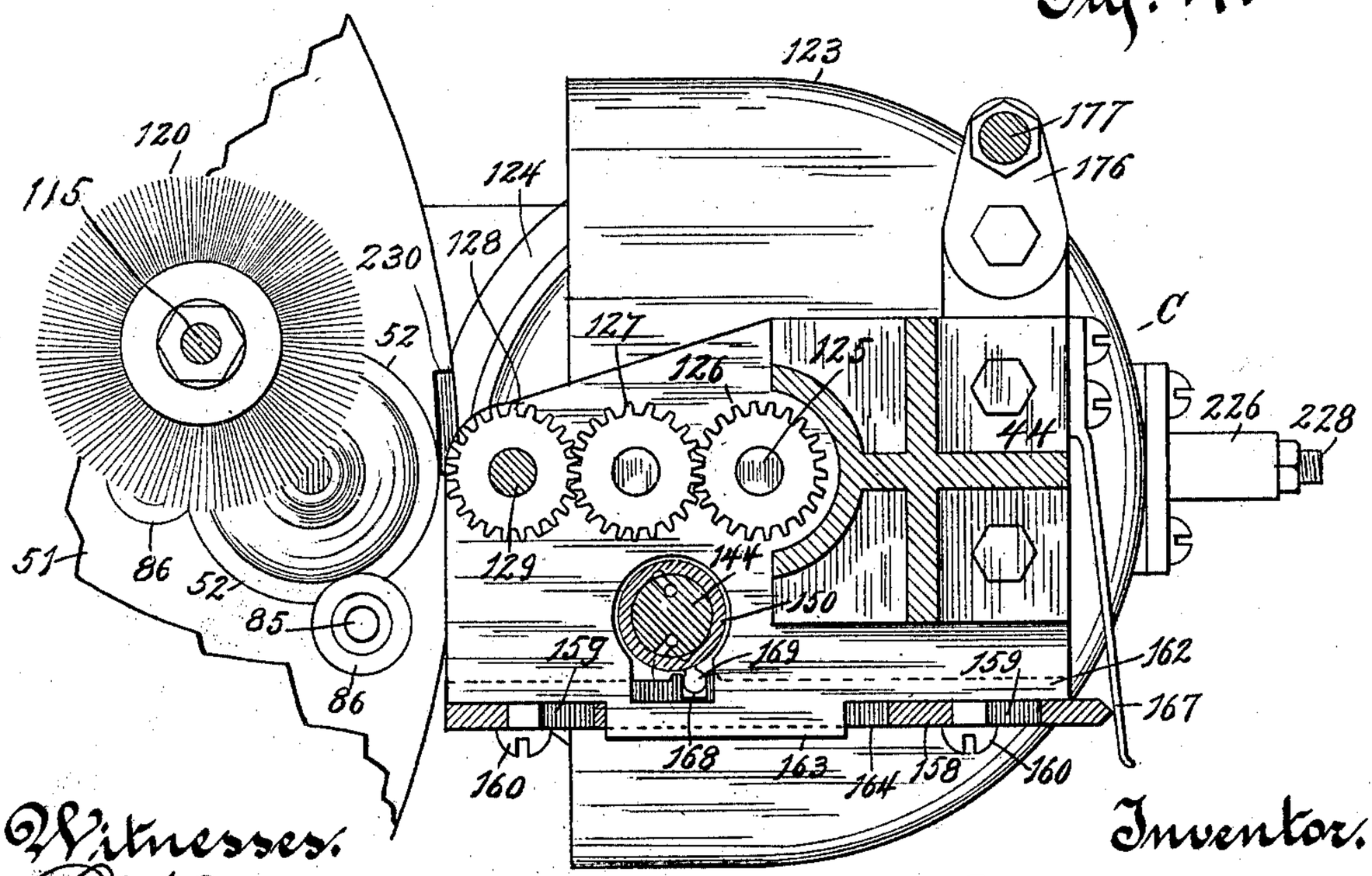

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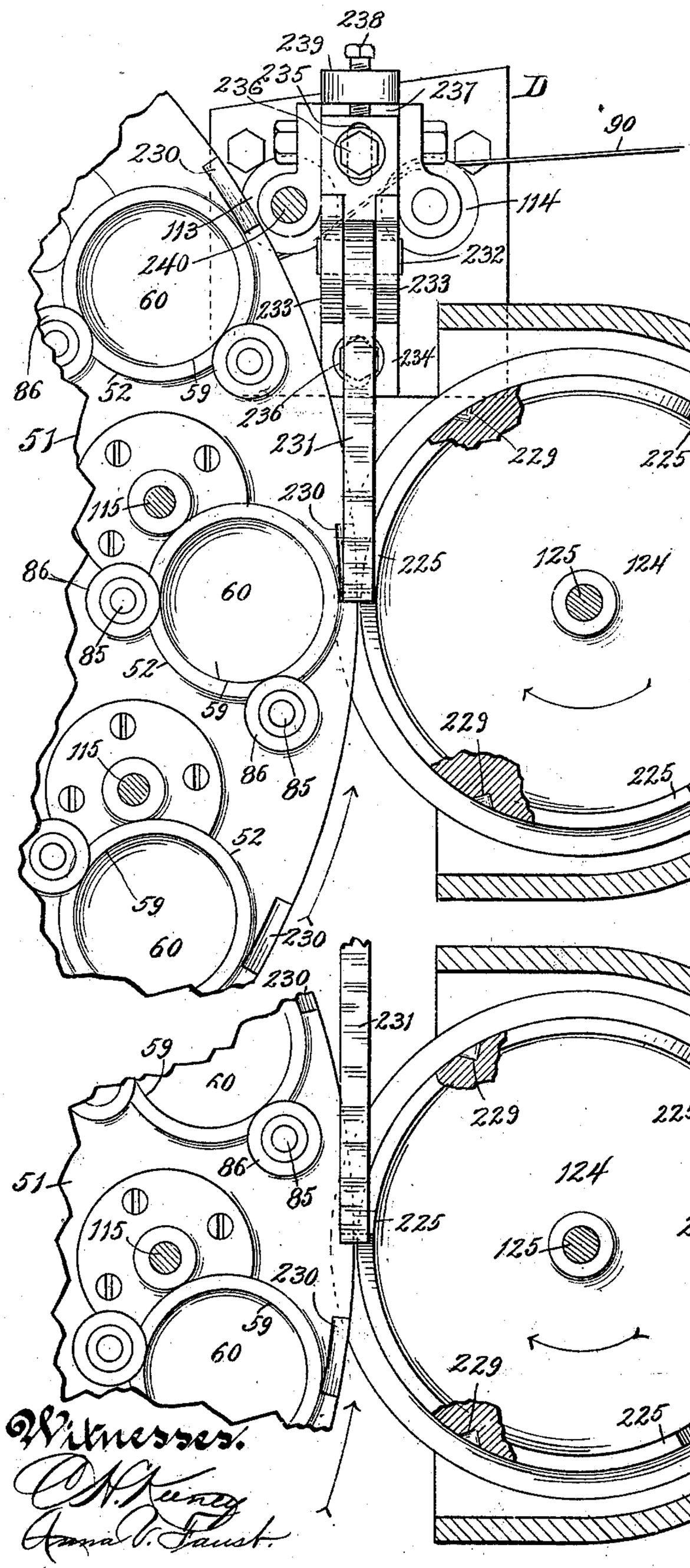

Fig. 18.

Fig. 19.

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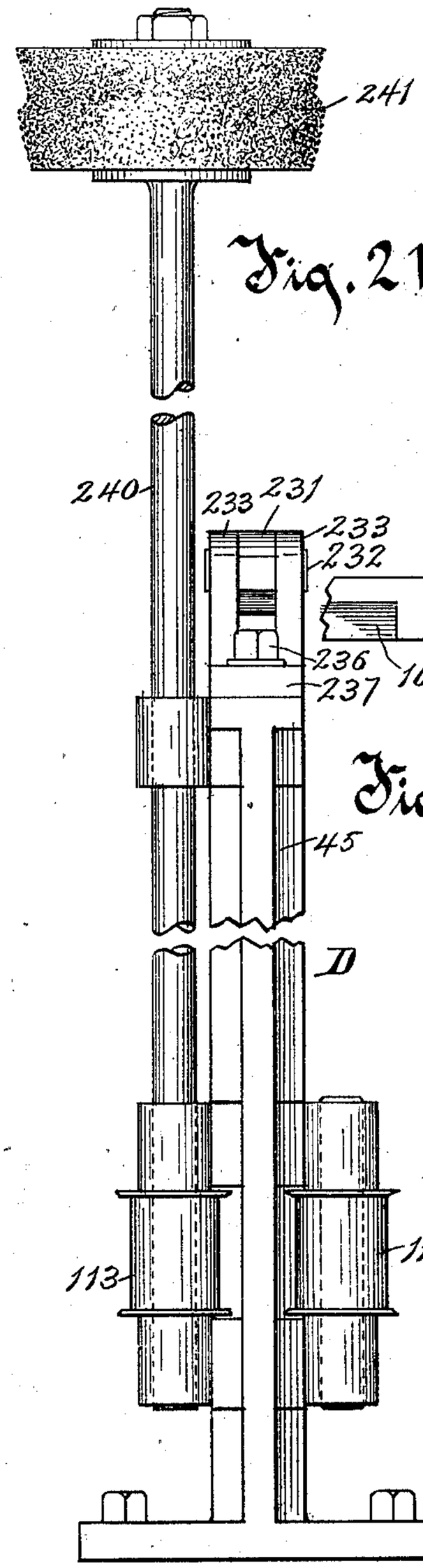

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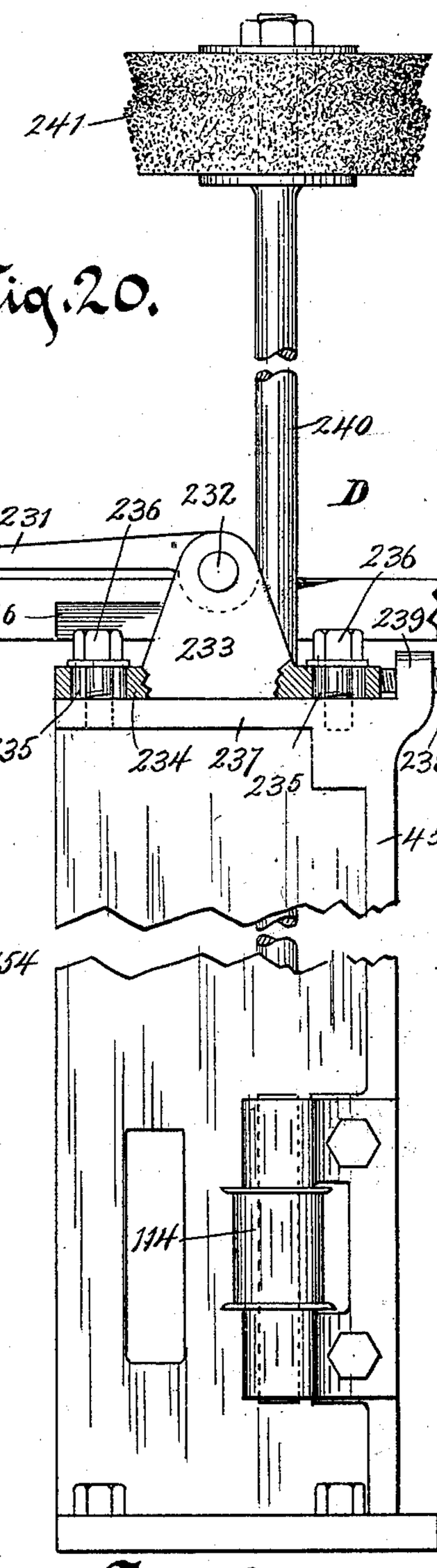

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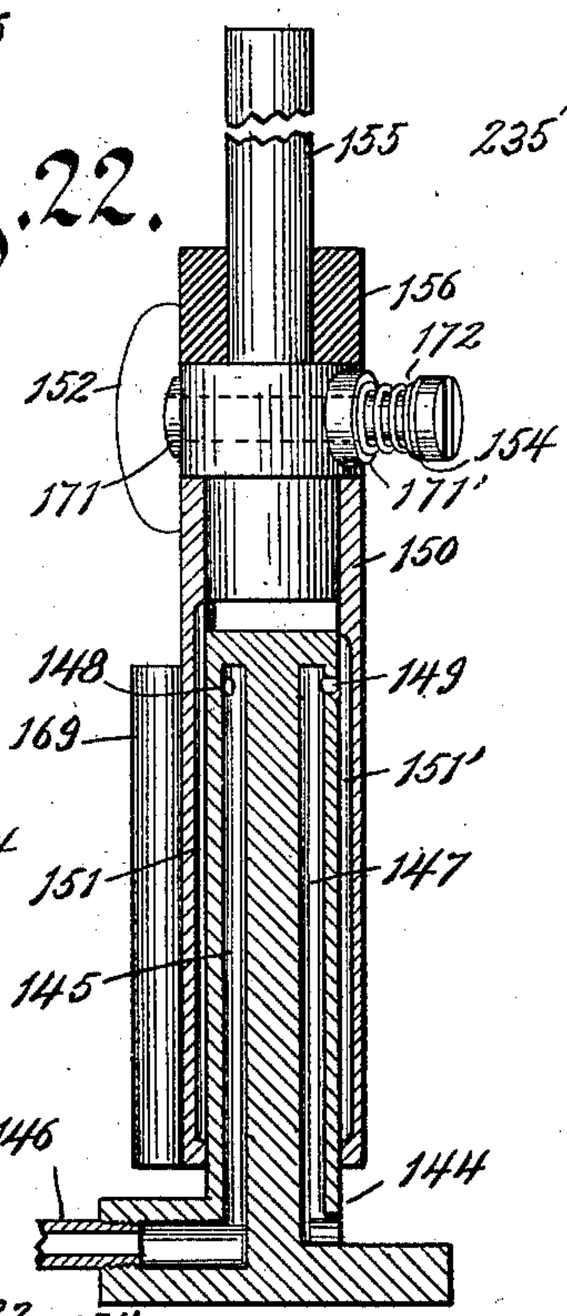
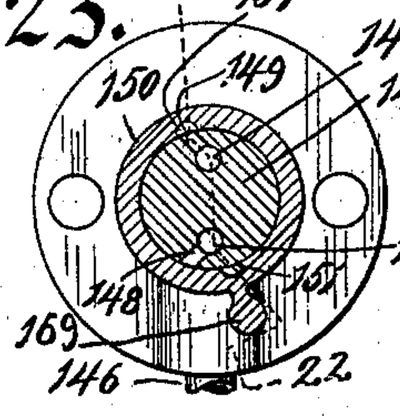


Fig. 22.

Fig. 23.



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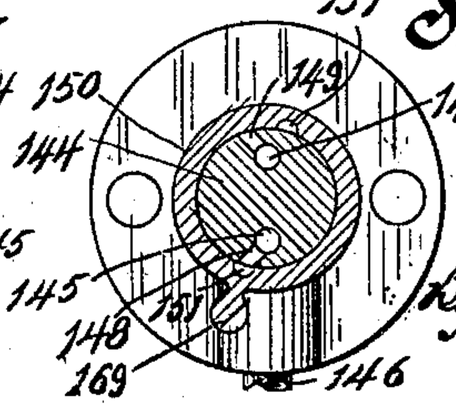

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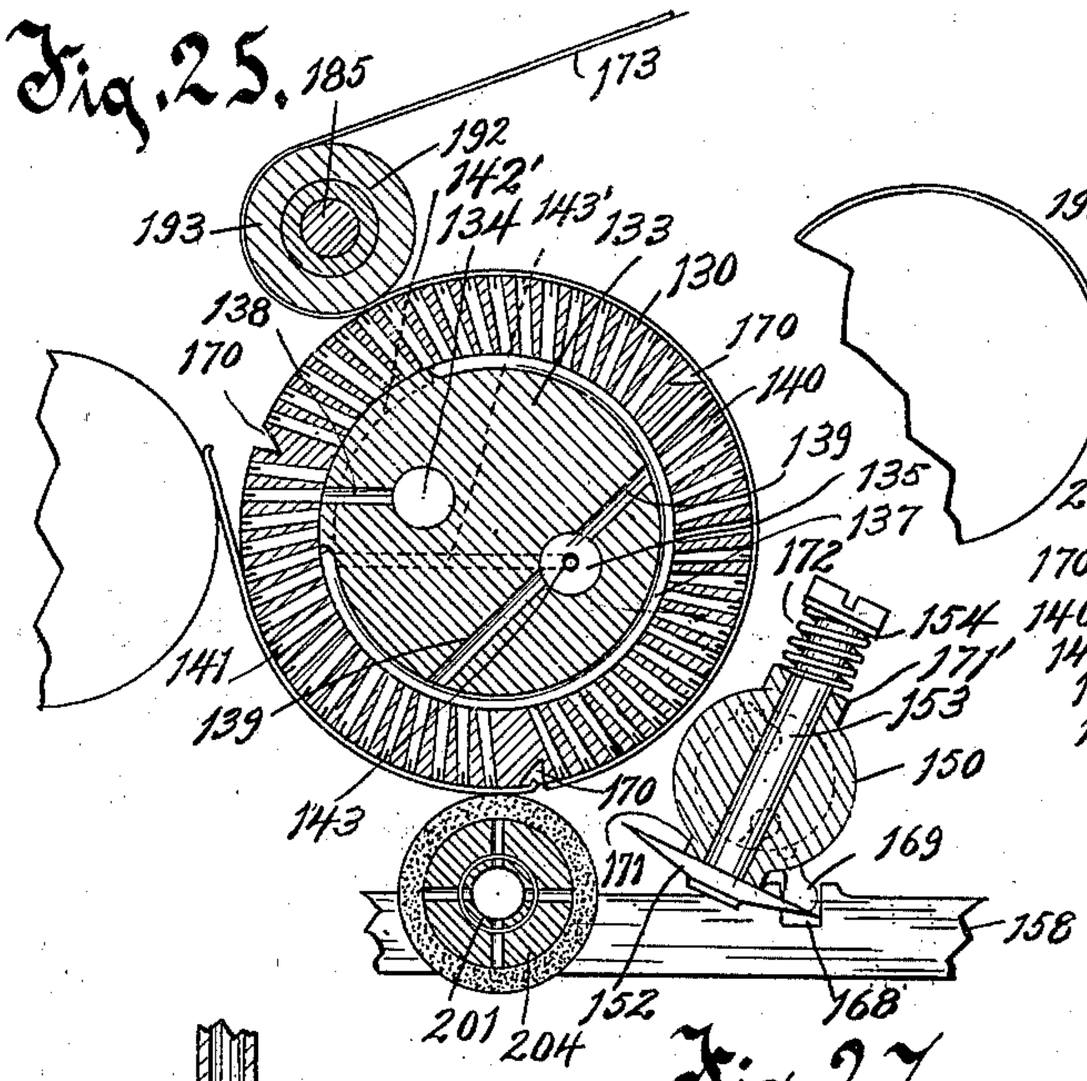
Fig. 25.



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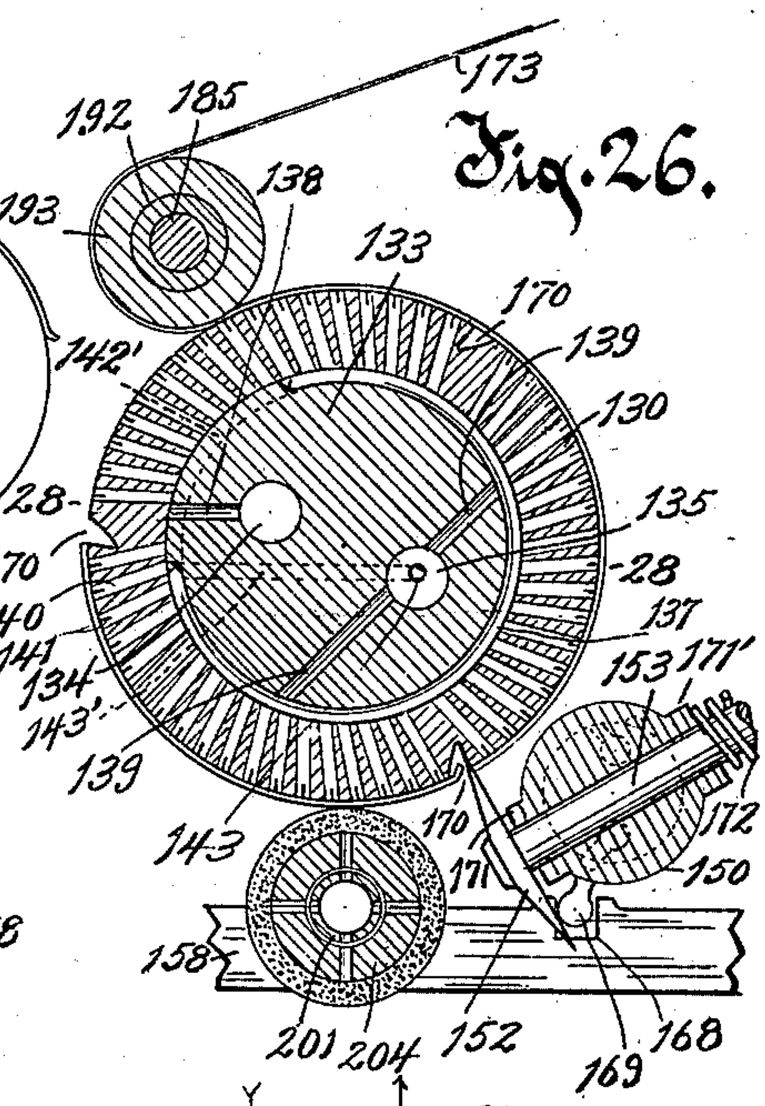

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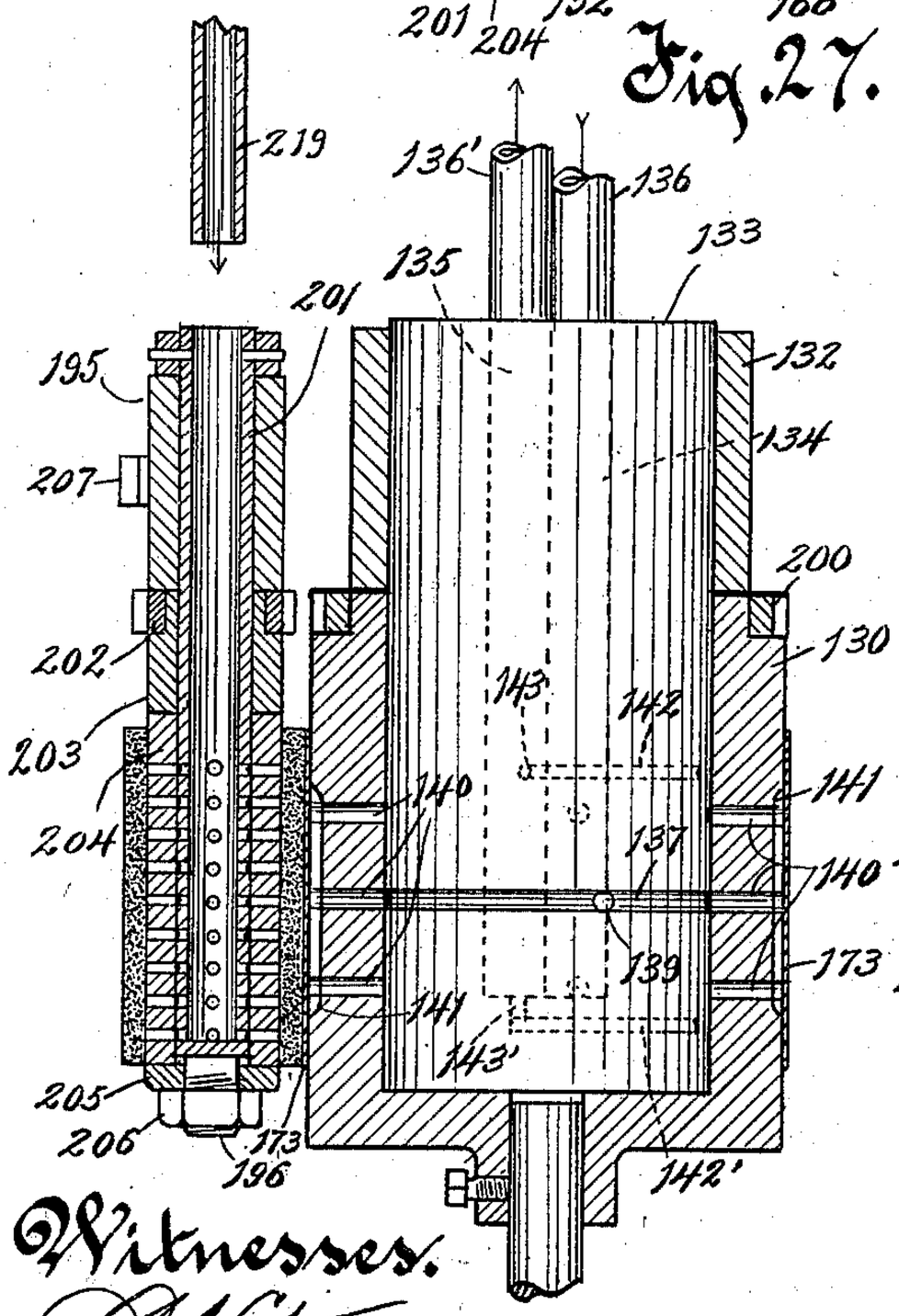

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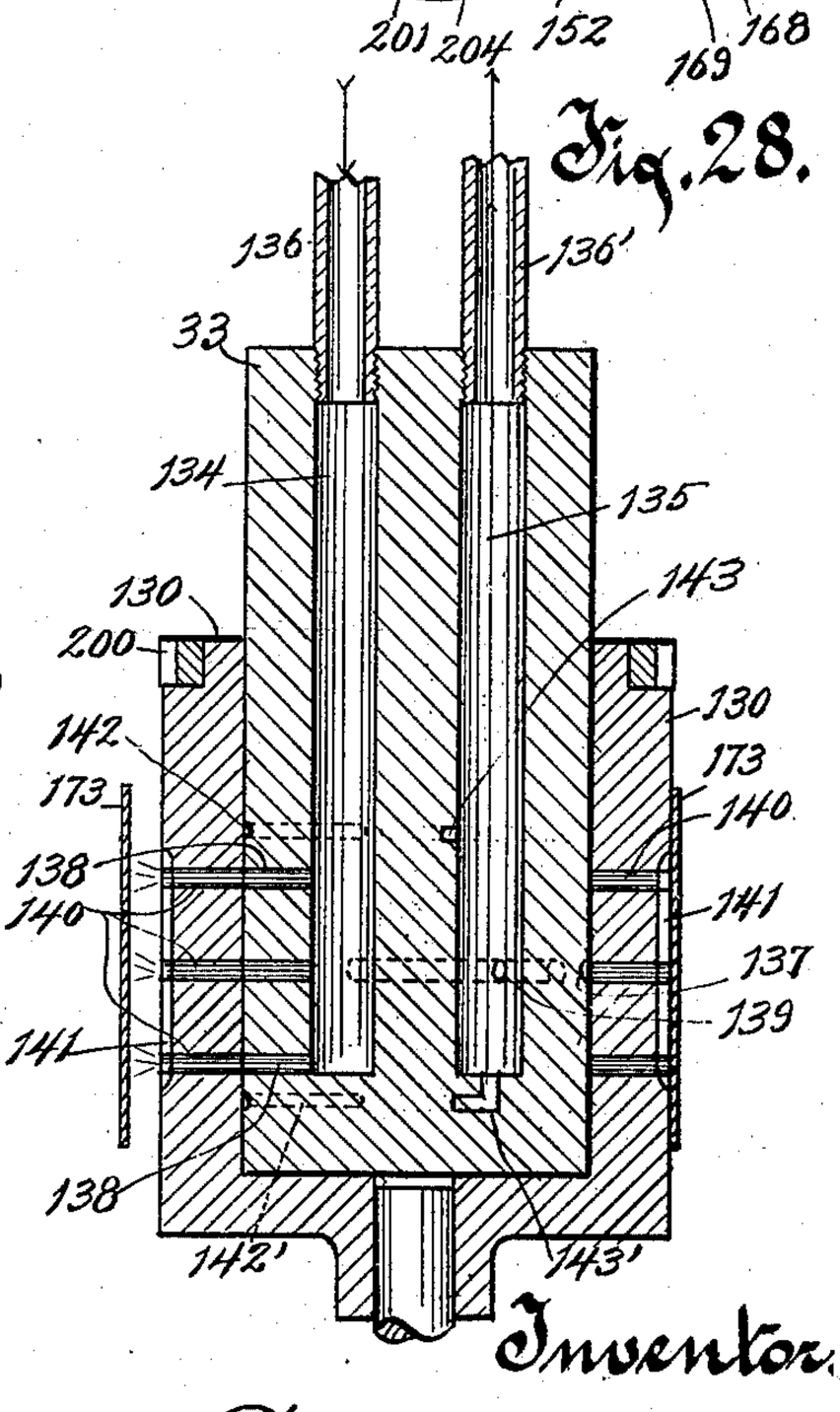

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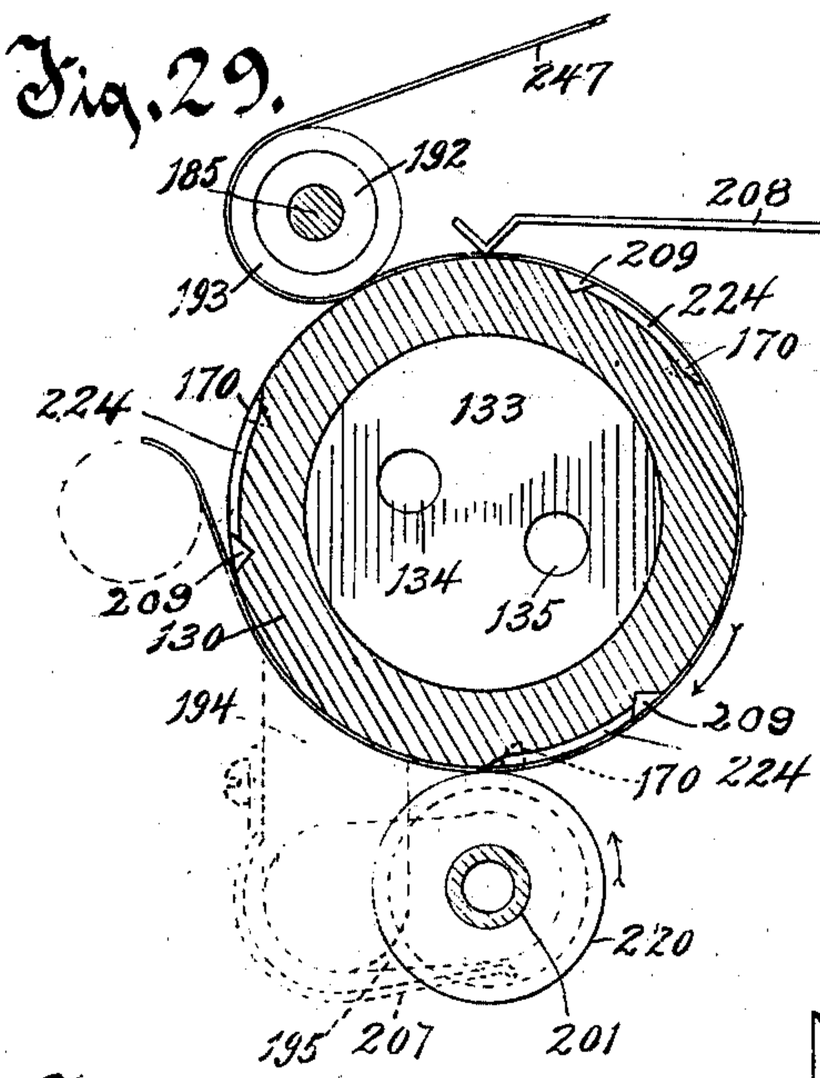
Fig. 29.



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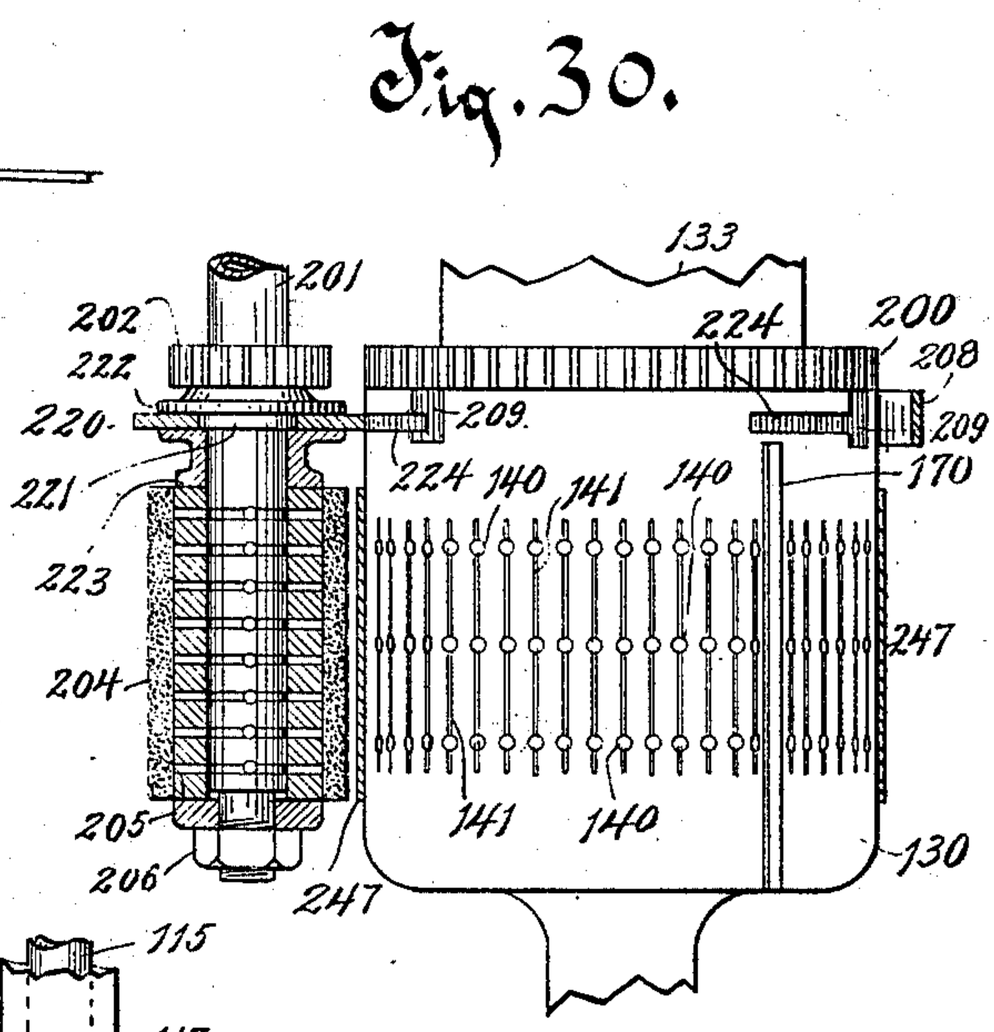

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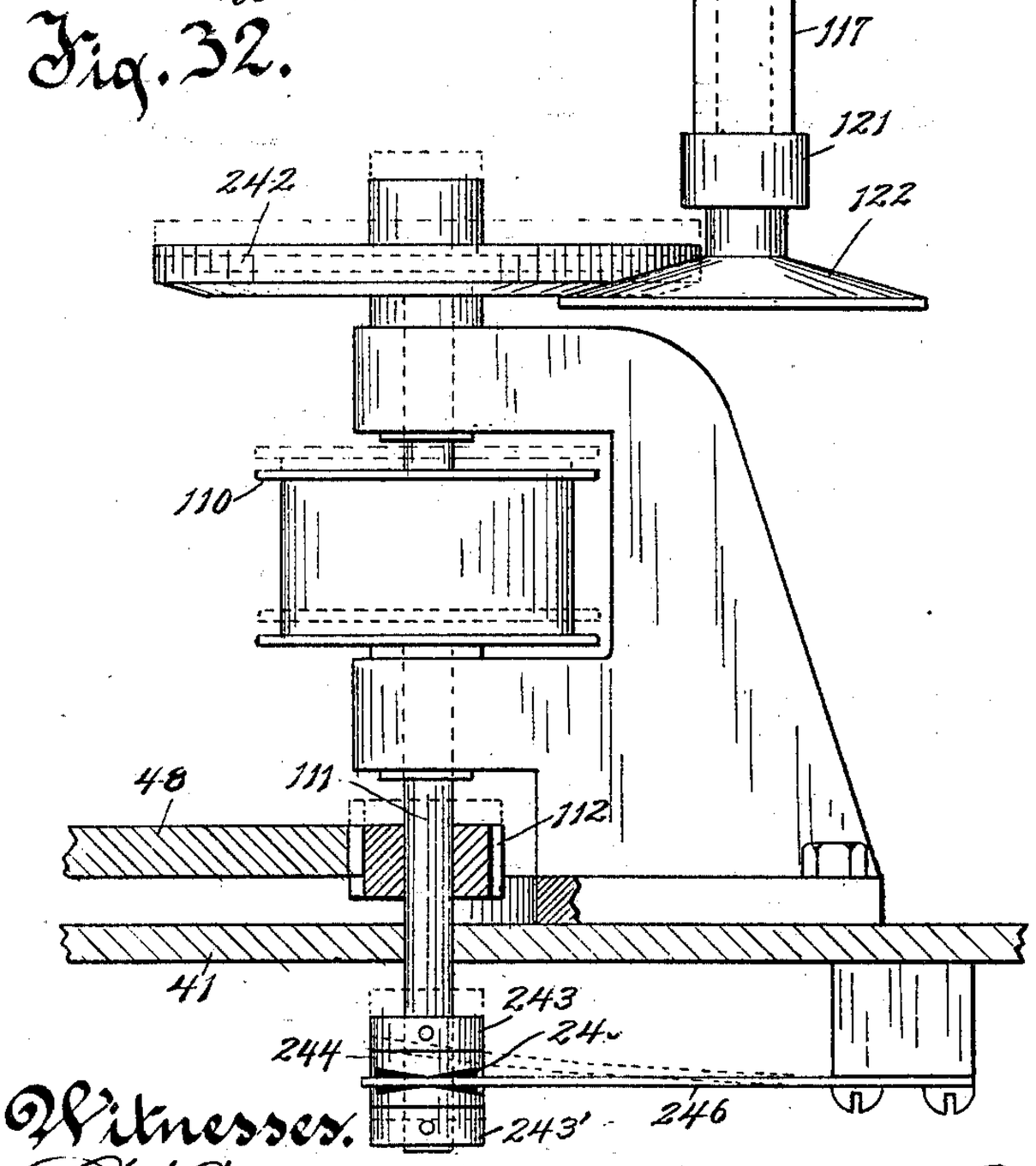

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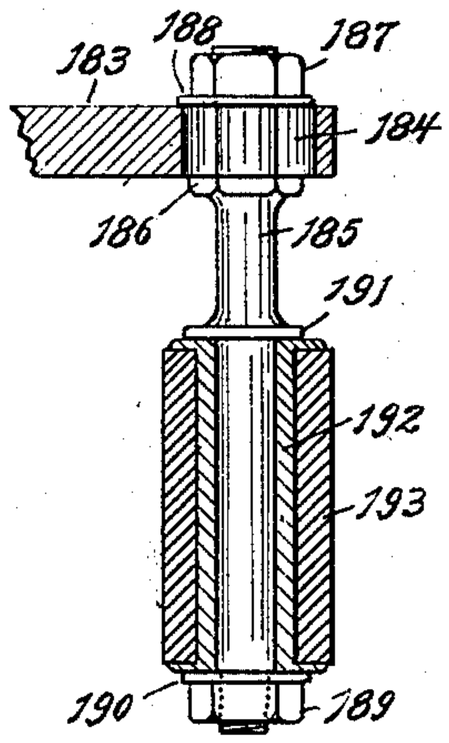

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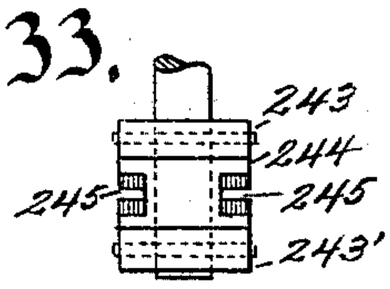

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Fig. 35.

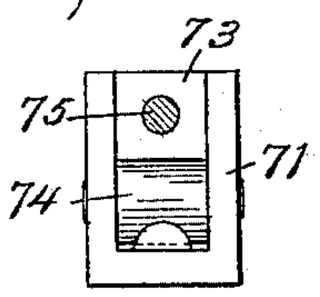


Fig. 34.

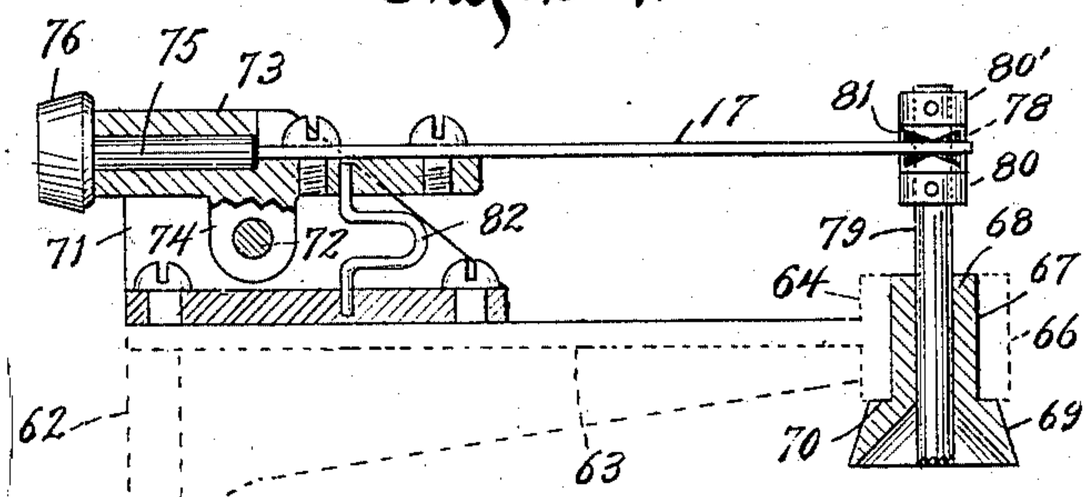


Fig. 36.

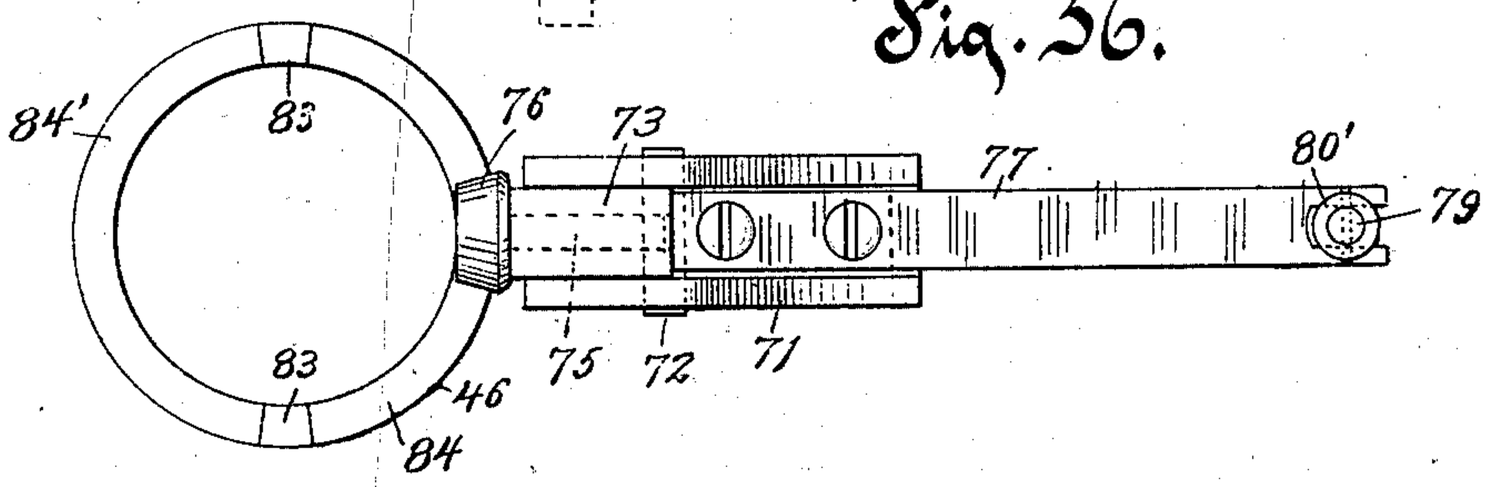


Fig. 37.

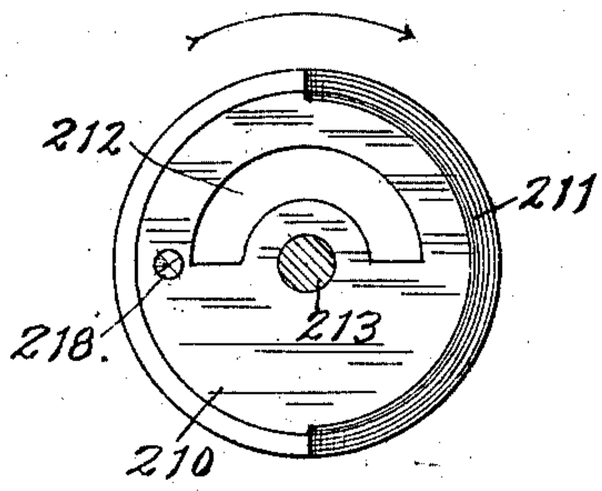


Fig. 38.

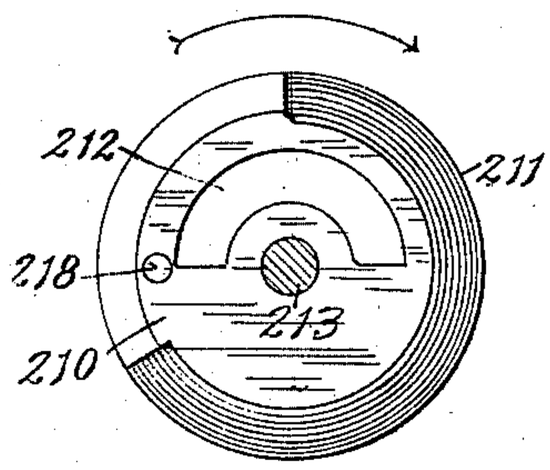


Fig. 39.

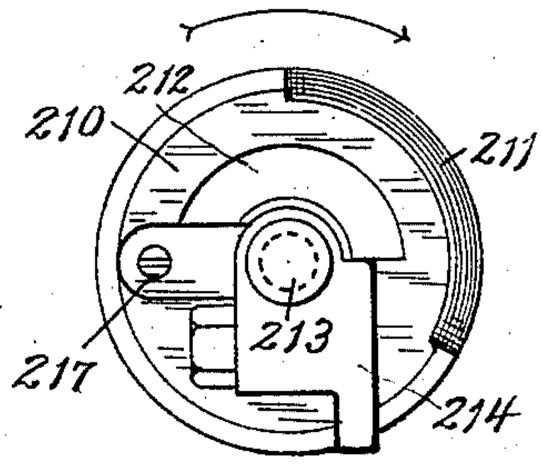
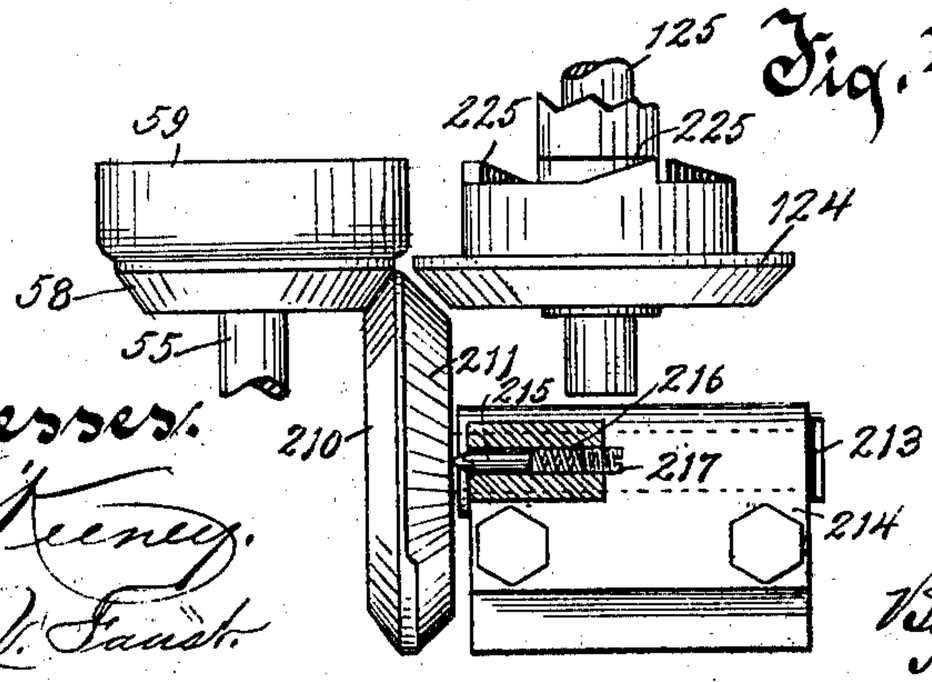


Fig. 40.



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UNITED STATES PATENT OFFICE.

WILLIS S. SHERMAN, OF MILWAUKEE, WISCONSIN.

LABEL-ATTACHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 671,005, dated April 2, 1901.

Application filed December 10, 1897. Renewed September 10, 1900. Serial No. 29,586. (No model.)

To all whom it may concern:

Be it known that I, WILLIS S. SHERMAN, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Label-Attaching Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in machines for affixing labels or other thin sheets of material to bottles or receptacles.

In large establishments—such, for instance, as breweries—many thousands of bottles each day are required to have labels affixed thereon. When this work is done by hand, it obviously necessitates the employment of many persons and the loss of a great deal of time, especially as in most cases bottles not only have labels affixed to the body thereof, but also to the neck portion, as well as tin-foil secured thereto around the upper portions of the necks. Further, the proper affixing of the labels is entirely dependent upon the accuracy of the eye of the operator.

It is the object of my invention to provide an improved machine which will perform the operations above referred to automatically; the invention being of such nature as not only to provide an improved construction for affixing labels to the bottles, but also of such construction as to be adaptable when a bottle is properly disposed on the table thereof to perform the operations of affixing a neck-label, body-label, and to finally wrap tin-foil around the neck of the bottle and incidentally performs the functions of applying glue to the labels preparatory to said labels being affixed, cutting the labels the proper length, brushing and smoothing said labels and the tin-foil, and finally brushing and polishing or burnishing said tin-foil.

With the above primary and other incidental objects in view my invention consists of the devices and parts or their equivalents, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a plan view of the complete machine with two of the corners broken away. Fig. 2 is a side elevation at right angles to the base. Fig. 3 is a vertical section approximately through the center of the table, but showing the body-label device in full line. Fig. 4 is a horizontal section below the table-line on an irregular plane, with some of the parts broken away to show the arrangement for revolving the mechanism at the different stations. Fig. 5 is a section through part of the machine to disclose the under side of the table, showing in dotted lines the relative positions of the different friction-gears and also showing one of the revolving disks as broken away. Fig. 6 is a side view of the upper portion of the first station for affixing neck-labels and showing only part of the table and also other parts broken away. Fig. 7 is a rear view of Fig. 6. Fig. 8 is a plan view of Fig. 6, showing somewhat more of the table than is disclosed in said Fig. 6. Fig. 9 is a cross-section on the line 9 9 of Fig. 6. Fig. 10 is a side view of the upper portion of the second station for affixing labels to the body of the bottle and showing part of the table in section. Fig. 11 is a rear view of Fig. 10, showing the paper-roll in section. Fig. 12 is a plan view of Fig. 10, parts removed and parts in section, and also showing the label partly attached to the body of the bottle and the knife out of cutting position. Fig. 13 is a plan view of Fig. 10, parts broken away, and showing the label in the act of being finally attached to the body of the bottle and also in the act of being brushed and the knife in the act of cutting the label the proper length. Fig. 14 is a side view of the upper portion of the third station for the tin-foil, parts broken away, and showing a fragment of the table. Fig. 15 is a rear view of Fig. 14. Fig. 16 is a plan view of Fig. 14, showing a fragment of the table. Fig. 17 is a plan view of Fig. 14, part in section. Fig. 18 is a plan view of a fragment of the table and a fragment of the third station and a part of the fourth station for brushing the tin-foil, showing the pawl released from the notch in the table and the wedge-pin of the third station in position to force the friction-wheel around a slight distance. Fig. 19 is a view similar to Fig. 18, the fourth station being omitted, but showing a fragment of the pawl which is attached to the fourth station and also showing the wedge-pin as having forced the friction-wheel around and further showing the pawl as raised and resting on the top of the table in position to engage the

next notch of the rotatable table, and furthermore showing the table as having rotated a slight distance. Fig. 20 is a side view of the fourth station, parts broken away, and showing the pawl in engagement with a notch in the table, a fragment only of the table being shown. Fig. 21 is a front view of the fourth station. Fig. 22 is a section of the knife-controlling mechanism, taken on the line 22 22 of Fig. 23. Fig. 23 is a horizontal section of Fig. 22, showing the air-ports in the position which they occupy when the label-cutting knife is out of operation. Fig. 24 is a horizontal cross-section of Fig. 22, showing the position of the ports when the label-cutting knife is in a cutting position. Fig. 25 is a horizontal section of the label-carrying drum or roller, showing the gluing-roller and a fragment of the body-label-cutting device and also showing the label as partly attached to a fragment of a bottle and the knife out of cutting position. Fig. 26 is a view similar to Fig. 25, showing the bottle as having passed by the label-drum and the label entirely attached to the bottle and the knife in the act of cutting the label. Fig. 27 is a section through the label-holding drum at the second station and also showing the gluing device, the inner part of the label-drum being in full line. Fig. 28 is a cross-section on the line 28 28 of Fig. 26, showing one portion of the label in section and as being held against the drum by means of a vacuum and another portion of the label in section and showing it as having been blown away from the drum by means of air-pressure. Fig. 29 is a section of the drum at the third station, or the station where the tin-foil is applied, showing said tin-foil as being attached to a bottle, said bottle being shown in dotted lines, and said figure also showing part of the mechanism in dotted lines for clearness of illustration. Fig. 30 is a rear view of the drum shown in Fig. 9, the gluing-roller being partly in section. Fig. 31 shows the rubber roller by means of which the labels or tin-foil are held up to the drum. Fig. 32 shows a portion of the mechanism for driving the brushes and revolving the bottles at the fourth station, parts being in section and broken away, and showing in full line the normal position of one of the friction-rolls and the other position of said friction-rolls in dotted lines. Fig. 33 is a detail of Fig. 32 at right angles to the position in which said detail is shown in Fig. 32. Fig. 34 is a detail of a device for holding the upper portion of the bottle, parts broken away. Fig. 35 is an end view of Fig. 34, parts being broken away. Fig. 36 is a plan view of Fig. 34, showing the upper part of the frame. Fig. 37 is a view of the friction-roll used at the first station. Fig. 38 is a view of the friction-roll used at the second station. Fig. 39 is a view of the friction-roll used at the third station, the direction of rotation being shown by arrows; and Fig. 40 is a detail of the friction-roll of the second station, showing the same in engagement with the bottle-revolving friction-roll and also showing the label-holding drum.

For the sake of clearness I will divide my machine throughout the description thereof into four principal subdivisions or parts, which I will designate as "stations" and indicate the same, respectively, by the letters A, B, C, and D. Station A is the station at which the neck-label is affixed; B, the station where the body-label is affixed; C, the station where the tin-foil is affixed to the neck, and D the station where the labels and tin-foil are finally smoothed by the same brush which previously acted on said labels and tin-foil, although at this station said brush is revolved at a faster rate of speed than its previous rate of rotation as compared with the other stations, the direction of revolution of the brushes and of the bottle being in an opposite direction, and at the same time at this station another and independent burnishing-brush is acting on the tin-foil to polish the same.

Referring to the drawings, the numeral 41 indicates a base for the machine, which base is provided at four different points, corresponding to the location of the stations A, B, C, and D, with vertical extensions 42, 43, 44, and 45, respectively. Also extending upwardly from the base is an upright or standard 46, provided with a base-plate 47, on which rests a gear-wheel 48. Surrounding the upright or standard 46 is a tubular shaft 49, having a base-flange 50, which rests on the gear-wheel 48. The weight of the shaft 49 and the parts carried thereby engenders sufficient friction on the gear to cause said gear to rotate the shaft and parts carried thereby therewith. At an intermediate point is affixed to the shaft 49 a table 51. This table is advisably of circular form and is provided therearound with a series of openings 52, twelve being provided in the machine illustrated in the accompanying drawings. The under side of the table is provided with a series of webs 53, each of which at its outer end supports a tubular portion 54, which forms a bearing for a shaft 55. These bearings are connected, and thereby strengthened and reinforced, by a brace 56, integral with and depending from the table and extending from one bearing to the other. The shaft 55 carries at its lower end a friction-roller 57 and at its upper end a bevel friction-roller 58. The upper portion of each friction beveled roller is formed or provided with a socket 59, and in the bottom of this socket is secured a buffer 60, composed of a plate of rubber or other suitable material. Each socket extends into one of the openings 52, and its function is to receive the lower end of the bottle.

Near its upper end the tubular shaft 49 is formed with a shoulder 61, which is adapted to support a hub 62, having a series of arms 63 radiating therefrom. The outer ends of

these arms are connected by a ring or annulus 64. The inner ends of the radiating arms are also connected by a circular web 65. The ring or annulus 64 is provided on its under side with a series of depending tubular bosses 66, and the ring or annulus is provided with openings, 67 in alinement with the bores of the bosses. Into the alined openings are fitted tubular stems 68. The stems extend below the lower ends of the bosses and are enlarged, the enlargement formed interiorly with a conical socket 69, in which the upper ends of the bottles are centered. The upper end of each enlargement forms a shoulder 70, which fits against the lower end of the boss.

Secured to the inner end of each arm 63 is a bracket 71, consisting of a base portion and the two opposite side portions. Extending from one side piece to the other of the bracket is a pin 72. The numeral 73 indicates a rocking lever which is provided with a depending ear 74, through which the pin 72 passes, said lever being permitted thereby to turn on or with the pin. The rocking lever for a portion of its length is tubular, and in this tubular portion is fitted a stem 75, which extends from a beveled roller 76, said beveled roller bearing against the inner end of the rocking lever. That portion of the rocking lever which extends outwardly from this tubular portion has secured thereto a flat spring 77. The outer end of the flat spring is bifurcated, and this bifurcated end straddles a collar 78, which collar is loose on the upper end of a vertical pin 79, said loose collar being located on the vertical pin between two fixed collars 80 80'. The loose collar is provided at opposite points with grooves or recesses 81, the opposite side walls of said recesses being conical, with the points or apices of the cones opposite. As the rocking lever turns the flat spring 77 turns therewith, and the points or apices of the conical sides of the recesses form fulcra for the turning of the end of the flat spring, and the divergent ends of the grooves permit the flat spring to assume different angles. The numeral 82 indicates a spring which at one end is secured to the base of the bracket 71 and at its upper end is connected to the rocking lever 73.

It will be understood that this machine is shown as capable of accommodating twelve bottles at a time, and the base or lower end of each bottle is adapted to fit in the sockets 59, while the upper ends of the bottles are fitted in the sockets 69, as will be hereinafter more fully described. There is for each bottle in the machine a construction similar to the parts shown in Fig. 34, which parts, therefore, throughout the several views will be designated by the same reference-numerals.

The upper end of the upright or standard 46 is formed with two inclines 83 83, which necessarily form two surfaces 84 84', the former being on a higher plane than the latter. The several beveled rollers 76 are adapted to rotate on the upper surface of the upright or standard 46, and as the shaft 49 is revolved, and consequently the radiating arms 63 revolve therewith, said rollers are compelled to travel around in a circle on said upper surface of the standard or upright and to ascend one incline and descend the other, thereby traveling from a lower to a higher plane, and vice versa. As one of the rollers 76 travels up an incline it will cause the rocking lever 73 to turn on its pivot and force downwardly the pin 79, carried at the end of the flat spring 77. This will cause said pin 79 to press on the stopper or cork of the bottle held in the socket 69 and also force the lower end of the bottle firmly into the socket 59. After thus ascending the incline the roller rides around on the surface 84, which is on the highest plane, until it reaches the other incline, when it descends, and this descent allows the spring 82 to act on the rocking lever in the opposite direction and raise the pin 79 out of contact with the stopper, and the roller then rides on the lower surface 84', which lower surface serves to hold the lever and the pin in their raised positions. It will be understood, of course, that with each rocking the same operation is repeated. The object of providing the rocking lever with the flat spring 77 is to permit said flat spring to allow or compensate for any inequalities in the stopper of the bottle or for any variations in the lengths of the bottles. The lower end of each pin 79 is preferably formed with teeth, as clearly shown in Fig. 34, whereby in case wires pass over the top of the stopper, as is frequently the case, the spaces between the teeth will accommodate the wires, and said teeth furthermore serve to prevent the pin slipping sidewise, and thus preventing the bottle from getting out of center.

Projecting upwardly from the table 51 are a series of studs 85, there being two of such studs for each opening 52 of the table and into which openings the sockets 59 extend. These studs have mounted revolubly thereon rollers 86, preferably having the peripheries thereof covered with rubber. Fig. 2 of the drawings shows one of the bottles in the act of being placed in position in the sockets. In the first place the upper end of the bottle is passed into the socket 69 and the lower end of the bottle swung in against the rollers 86, which rollers center the lower end of the bottle directly in alinement with the lower socket 59.

Mounted in a bearing formed on or fastened to the base 41 is a vertical shaft 87. Carried on the shaft 87 is a double-band pulley 88. Around the lower portion of this pulley passes a belt 89, which leads to any suitable source of power-supply. Around the upper portion of the band-pulley 88 passes another belt 90, which extends to and around an idle pulley 91, mounted fast on a vertical shaft 92, rotatable in a suitable bearing therefor in the base. The belt next passes around a pulley 93, which is mounted on a shaft 94, said shaft turning in boxes 95 95, which boxes project

from and are made integral with a bracket 96, said bracket being slotted to accommodate the pulley. The bracket is supported on a pivot 97, and one end of said bracket is formed with a projecting apertured lug, through which the upper end of a stud 98 passes. The stud is encircled beneath the lug by a coiled spring 99, the lower end of said spring bearing against adjusting jam-nuts 100 100, whereby the tension of the spring may be regulated. Taking onto the upper end of the stud 98 are jam-nuts 101 101, which serve to hold the pivoted bracket in adjusted position. The upper end of shaft 94 has mounted thereon a friction-wheel 102. This friction-wheel is adapted to engage the friction-wheel 57 at the lower end of the shaft 55, which shaft through the upper friction-wheel 58 rotates a bottle. The object in mounting the shaft 94 in the bracket 96 is to provide against any slight error of construction and, furthermore, to allow for wear in the journal-boxes 54 and 95. It will also be noted that the pivot-center of the bracket is in line with the central strain of the belt, whereby the action of the spring 99 is not appreciably affected. The pivot 97 of the bracket, as will be seen from Fig. 4 of the drawings, is a spool, which fits an opening in the bracket, and its inner end bears against the vertical extension 42. A screw 103 passes through this spool and engages a threaded opening in the extension 42, while its head bears against the outer enlarged end of the spool, the shoulder 104, formed by the enlarged end of the spool, bearing against the bracket. It will be noticed that the opening in the spool for the screw is sufficiently greater in diameter than the diameter of said screw so as to leave a slight space between the two. In the first place the spool affords an augmented bearing-surface circumferentially in the spool and also at the outer end of the spool by the shoulder 104, and in the second place from the fact that the bore of the spool is sufficiently greater in diameter than the screw to leave a space an opportunity for adjusting the bracket, and with it the friction 102, is afforded.

In order to give more friction-surface to the belt 90, another idle wheel 105 is provided, around which said belt passes. From this pulley the belt is extended to another pulley 106, which is pivoted and otherwise arranged in exactly the same manner as the pulley 93, and it is then passed around another idle pulley 107, similar to pulley 105, and thence to and around another pulley 108, similar to pulleys 93 and 106. This pulley 108 is also pivoted and otherwise arranged exactly in the same manner as pulleys 93 and 106. Hence in the drawings I employ the same reference-numbers to indicate the pivots and other corresponding parts contiguous to these pulleys. It will be understood that pulleys 93, 106, and 108 and their parts are arranged in the machine at points corresponding to stations A, B, and C. From pulley 108 the belt is extended to and around another idle pulley 109, similar to the pulleys 105 and 107, and from this idle pulley 109 is extended to a pulley 110, mounted on a vertical shaft 111, which shaft also carries a pinion 112, which meshes with and drives the gear-wheel 48. From pulley 110 the belt is extended to and into the groove of a small driving-pulley 113, thence over an idle pulley 114, and finally back to the main driving-pulley 88.

The table 51 carries a series of spindles, one for each bottle carried by the table, one of said spindles being shown in dotted lines in Fig. 2. This spindle is indicated by the numeral 115, and its upper end has its bearing in a box 116 and its lower end in a box 117. Mounted on each of these spindles are three brushes, the lower brush 118 being the brush for the body-label of the bottle, the intermediate brush 119 being the brush for the neck-label, and the upper brush 120 being the brush for the tin-foil. These brushes are separated and held apart by means of sleeves. The brushes are held down to place on the spindle by means of a nut and washer turning on the spindle and binding the brushes between the washer and a lower collar. The lower end of each spindle, which extends below the box 117, has mounted thereon a friction-wheel 121, and also at its lower extremity another friction-wheel 122. These two friction-wheels are preferably in one piece and fastened to the spindle. The upper surface of the lower wheel 122 is of conical form. Each brush-spindle is rotated when its adjacent bottle reaches the respective stations A, B, and C by means of the friction-roller 57, the latter engaging the friction-roller 121. Rotation to this roller 57 is imparted at each station A, B, and C by means of the friction-roller 102 engaging said roller 57. It will be understood that each one of the brush-spindles is rotated in this manner at each station A, B, and C.

The construction of the mechanism at each of the stations A, B, C, and D will now be explained in regular sequence.

The mechanism at station A is supported by the vertical extension 42 of the base. Forming part of said mechanism is a housing 123. In this housing is located a friction cam-wheel 124, said wheel being mounted on a vertical shaft 125, said shaft carrying at station A as well as at station C at its upper end a pinion 126, which meshes with an intermediate pinion 127, which intermediate pinion in turn meshes with another pinion 128, carried on a shaft 129. This shaft 129 has mounted thereon a body-label drum 130. The numeral 131 indicates a top plate connected at one end to the upper end of the vertical extension 42. This top plate is formed with an upwardly-extending tubular boss 132, in which is fitted a cylindrical plug 133. This is surrounded below the boss by the label-carrying drum 130. Extending vertically from the upper end of the plug and downwardly to a point near the lower end thereof are two passages,

134 135. To the upper ends of these passages are connected pipes 136 136′. The plug is also formed partly around its circumference with a channel 137. The pipe 136 and the passage 134 are for the inlet-air, and said passage 134 has branch passages 138, leading therefrom out through the plug. The pipe 136′ and passage 135 are for the exhaust-air. The circumferential channel 137 has extending therefrom two branch passages 139 139, which lead to the exhaust-passage 135. The label-drum 130 is provided around its entire circumference with a series of vertically-alined holes 140, which are connected by means of vertical grooves 141. Air is introduced into the inlet-pipe 136, which pipe leads from any suitable source of supply, and the air passes through said pipe into the passage 134, thence through the branch passage 138, and as the label-drum is revolved in the manner hereinafter described the air will pass out of said branch passage 138 and be forced successively through the openings 140 and the air directed against the label for the purpose of positioning the label on the bottle, as hereinafter more fully referred to. In order to hold the label on the drum, I provide a suction through the suction-pipe 136′, passage 135, channel 137, and branch channels 139 139, leading from said channel 137 to the suction-passage. It will be understood, of course, that the pipe 136′ is connected to any suitable form of pump for exhausting the air. It will be observed that the air suction and the outgoing blast have a force in substantially the same direction, which might possibly have the effect of causing undue wear on the plug, if not the effect of creating such a friction on the label-drum as to retard the rotation of said drum. In order to counteract this, I form the outer surface of the cylindrical plug with channels 142 142′, from which lead passages 143 143′, extending to the suction-passage 135, (see Figs. 25, 26, 27, and 28,) which creates a counter suction in the opposite direction.

Secured to the top of the housing 123 is a stationary piston 144, forming part of the operating mechanism for the label-cutting device. It has an inlet-channel 145 formed therein, to which a pipe 146, leading from any suitable source of supply, is connected, said pipe adapted to conduct compressed air into the inlet-channel. The exhaust-channel is indicated by the numeral 147, the lower end of which leads to a discharge-opening in the side of the piston. Both the inlet and discharge channels terminate at their upper extremities below the upper end of the piston and have extending therefrom, respectively, branch passages 148 and 149. Surrounding the piston is a knife-carrying cylinder 150, having the opposite longitudinal ports 151 151′, which are adapted, as the cylinder is oscillated in the manner hereinafter described, to respectively register with the branch passages 148 and 149, leading from the inlet and exhaust passages of the piston. The head of the cylinder is formed by a solid plug, and the cutting-knife (designated by the numeral 152) is provided with a spindle 153, which passes through and is journaled in the plug. The outer end of the spindle is formed with a screw-head, and adjacent to the inner side of this head is a washer 154. The plug is also provided with an upwardly-extending stem 155, on which is mounted a buffer 156, of rubber or analogous material. This stem extends upwardly through a plate 157, bolted to the top plate 131, said plate 157 forming a guide for the knife-carrying cylinder in its movement. The up movement of the cylinder 150 is limited by contact of the buffer 156 with the plate 157. It will be understood that the cutting-knife is of circular form and is mounted revolubly on the end of the spindle.

The numeral 158 indicates a longitudinally-movable bracket provided with elongated slots 159, through which screws 160 pass and enter the vertical extension 42. The bracket is also provided with a groove 161, into which fits a tongue 162, formed on the extension 42 and serving as a guideway for the movement of the bracket. This tongue at an intermediate point is extended outwardly, as indicated at 163, through a long slot 164, formed in the bracket, and serves to limit the movement of the bracket in either direction. The forward end of the bracket is provided with an angular lug 165, which lug normally bears against the periphery of the table. The table, however, at certain points of its periphery is provided with undercut recesses 166, (one of said recesses being provided for each bottle carried by the table,) into which the angular lug is adapted to enter after the table has rotated, so as to bring the undercut recess in register with said angular lug, the bracket carrying the angular lug being forced forwardly by the action of a spring 167 on the rear end of the bracket, the contact of the end of the outward projection 163 of the tongue 162 with the end of the slot 164 limiting the extent of this forward movement. The object of moving the bracket longitudinally is to turn the cylinder 150, with its knife 152, from a normal position to a cutting position. This is effected by forming the longitudinally-movable bracket with a vertical opening 168, which is adapted to receive a vertically-elongated lug 169, formed on the cylinder 150, a longitudinal center line through the lug being on the same plane as a center line through the cylinder in order to enable the knife to travel in a straight line. The longitudinal forward movement of the bracket not only causes the knife to assume a cutting position, but it also causes the cylinder 150 to be rotated to such an extent as to bring the branch passage 148, leading from the inlet-channel 145, into register with the port 151 of the cylinder, as clearly shown in Fig. 24. The compressed air is now free to pass into the port 151 and thence into the space above the sta-

tionary piston, where it acts upon the head of the cylinder 150 and causes an ascent of said cylinder to the limit permitted by the buffer 156, which movement, however, is sufficient to permit the knife to pass the distance of the width of the label, and thereby cut said label transversely. It will be noticed, particularly from Figs. 25, 26, and 30, that the outer surface of the label-carrying drum is formed with one or more elongated notches 170. In the present illustration of my invention I have shown three of such notches. These notches receive the cutting-knife, and the straight wall of each notch forms, in connection with the cutting edge of the knife, a complete shear. The augmented space formed by the curved surface permits the knife to enter the notch freely, as the knife is swung in the arc of a circle. The knife is swung in the arc of a circle by the movement of the reciprocating bracket 158. The knife makes its cut while the drum is stationary and the table is revolving. As the table is revolving the angular lug of the bracket is acted upon by reason of the fact that the end of said lug is forced out of the undercut recess of the table by the outwardly-curved end of the recess, and said bracket, of which the lug forms a part, is thereby forced rearwardly against the action of the spring. The cylinder 150 is provided at diametrically opposite points with lugs or projections 171 171′. Between the head of the spindle of the cutting-knife and the lug 171′ the spindle is encircled by a coiled spring 172. This spring normally holds the inner face of the cutting disk or knife against the end of the lug 171. When, however, the cutting edge of the knife comes in contact with the straight wall or shear edge of the notch 170, the knife will be stopped. The cylinder, however, not having completed its partial rotation, will draw away from the knife, leaving a space between the end of the lug 171 and the inner face of the cutting-disk and at the same time compressing the coiled spring. With the continued rotation of the cylinder the knife-edge advances inwardly along the straight or shear edge of the notch toward the center of the label-drum until the longitudinally-movable bracket and the cylinder 150 come to a state of rest. Preferably the spindle or axis of the cutting-disk is arranged at a slight angle to the center line of the cylinder in order to effect a perfect shear cut. When the reciprocating bar makes its return movement, the cutting-knife is turned back to its normal position, (shown in Fig. 25,) and at the same time the cylinder 150 is revolved, so as to bring the discharge-passages into register to permit the down movement of the cylinder with its knife. In order to guard against unnecessary jar on the down movement of the cylinder 150, the upper end of the said exhaust-port in the cylinder terminates short of the cylinder-head, so that an air-cushion is formed between the upper end of the stationary piston and the under side of the cylinder-head.

The labels are printed on a continuous strip 173, which is wound about a spool 174. This spool is provided at its lower end with a disk-flange 175. Secured to and extending upwardly from an arm 176 is an upright 177, said upright formed at its upper end with a friction-head 178, upon which rests the disk-flange 175 of the spool. The friction-head is also provided with an upwardly-extending spindle 179, which extends through the bore of the spool and forms an axis around which said spool may revolve. The upper end of the axial spindle is threaded to receive a nut 180, and between this nut and the upper end of the spool is a coiled spring 181. By turning the nut downwardly the disk-flange of the spool may be made to bear with greater or less force on the friction-head of the upright, and consequently the spool be permitted to revolve with greater or less freedom. Preferably mounted on the upper end of the axial spindle of the spool is a washer 182, which takes the bearing of the lower end of the spring.

Extending from the top plate of the frame is an arm 183, which is provided at its outer end with an elongated slot 184. Into this slot projects the upper end of a stud 185, said stud being formed with a shoulder 186, which bears against the under edges of the slot. The upper end of the stud carries thereon a nut 187, between which and the slot is interposed a washer 188. The lower end of the stud is also threaded to receive a nut 189, above which is disposed a washer 190. Between this washer and an intermediate shoulder 191, formed on the stud, is a roller 192. This roller is preferably surrounded by an outer peripheral flexible cover 193, advisably of rubber. The paper having the labels printed thereon is carried from the paper-spool 174 between the flexible cover of the roller 192 and the label-drum, said roller 192 being in such close juxtaposition to the label-drum as to hold the paper firmly thereto. The stud of the paper-roller is adjustable in the elongated slot of the arm 183 in order to permit the roller to be properly adjusted, and the flexible or yielding cover of the paper-roller is for the purpose of pressing the paper firmly against the label-drum throughout the length of said drum. This flexible or yielding cover, furthermore, affords a better surface for drawing the paper. Still further, as the roller is in frictional contact with the surface of the label-drum said roller is rotated by the drum, and consequently draws the paper from off the spool, thereby relieving the label-drum of the strain of unwinding the paper.

Projecting from the top plate of the frame is another arm 194, the outer end of which is bifurcated. Between the furcate parts is the end of a swinging or pivoted arm 195. A vertical spindle 196 passes through the swinging

arm 195 and also through the fixed arm 194, said spindle forming a pivot for the swinging arm 195. To the lower end of the spindle is secured a pinion 197. Also journaled in the fixed arm is a spindle 198. This spindle carries a pinion 199, which pinion is in mesh with the pinion 197 and also in mesh with a gear-wheel 200, fast to the upper end of the label-drum. The swinging arm 195 carries at its outer end a spindle 201, which spindle has mounted thereon a pinion 202. Below the pinion is a washer 203. (See, for instance, Figs. 10 and 11.) Beneath the washer is a paste-roll 204, preferably of a form to be hereinafter described. This paste-roll is confined on the spindle between the washer 203 and a lower washer 205, said lower washer being held up to the roll by means of a nut 206. The paste-roll is held yieldingly to the label which is against the drum by means of a spring 207, the free end of said spring bearing against the swinging arm 195. The extra pinion 199, meshing with the gear-wheel 200, is employed for the purpose of imparting opposite rotations to the label-drum and paste-roller. It is obvious that if said label-drum and the paste-roller rotated in the same direction there would be a tendency of the paste-roller to tear or lift the label from the drum. This provision therefore is made for the purpose of counteracting this tendency, and the difficulty is furthermore rendered impossible in view of the fact that the peripheral speed of rotation of the paste-roller is greater than the peripheral speed of rotation of the label-drum. This greater speed of the paste-roller also serves to spread the paste, as in the case of a brush.

Attached to the uprights 42, 43, and 44 at stations A, B, and C are springs 208, which springs at their free ends are adapted to engage successively notches 209, formed in the upper portion of the periphery of each label-drum. At each of these stations, therefore, one of these springs is provided, and the label-drum at each of said stations is provided with three of these notches, which are engaged by the spring. The notches 209 are so positioned with relation to the elongated notches 170 that when one of these notches 209 comes into position to receive the end of the spring 208 the elongated notches 170 will be in position to receive the cutting-knife.

The friction cam-wheel 124, hereinbefore referred to, is driven by means of the engagement therewith of one face of a double beveled friction-wheel 210, the other beveled face of said double friction-wheel adapted to be engaged and driven by the friction-rollers 58. This wheel of station A is shown in Fig. 37, and its relative position with relation to wheels 58 and 124 is shown in Fig. 40. The beveled peripheral face of this friction-wheel 210, which is adjacent to the wheel 124, is cut away for a desired distance, as indicated at 211, so that in revolving in this particular construction the said wheel only makes frictional contact with wheel 124 for such a distance as to rotate said wheel 124 for substantially one-third of a revolution. Of course the cut-away portion may be arranged to rotate wheel 124 any other desired distance to correspond with any other construction of the other parts of the machine, so as to make the wheel 124 properly perform its function. It will also be noticed that wheel 210 is provided with a cut-out portion 212, which lightens the upper portion of said wheel, and thereby renders the lower portion necessarily heavier. The axis or shaft of wheel 210 is indicated by the numeral 213 and is journaled in a bearing 214, so as to be movable endwise therein for a short distance. Fitted movably in a recess in a lug projecting from this bearing is a pin 215, and a coiled spring 216 is also arranged in the recess and bears outwardly against the inner end of the pin, so as to force the outer end of said pin against the face of the beveled wheel 210, thereby keeping said wheel in contact with the friction-wheel 57. A screw 217 passes through the end of the lug and bears against the end of the spring, so as to regulate the compression of said spring. The advance end of the contact-surface on the side of the wheel 210 which is cut away is brought into a vertical line through the center of its axis, when the weighted portion of said wheel acts to turn the wheel to a normal position. The face of the cut-away side of wheel 210 is formed with a conical recess 218, which is adapted to receive the conical end of the pin 215 after the wheel has been returned by gravity to the position shown in Fig. 37. The oscillation of the wheel 210 in turning by gravity to the Fig. 37 position is stopped quicker by the engagement of this pin in the recess than would otherwise be the case. It may be well to state at this point that gravity will not of course act on wheel 210 until said wheel is out of engagement with wheel 58, and it is out of engagement with said wheel 58 when the table is revolved. The friction-wheel 210, just explained and shown in Fig. 37, is located at station A. Stations B and C have similar friction-wheels, excepting that one face of friction 210 at station B is cut out for substantially two-thirds of its circumference, while the similar wheel at station C is cut out for substantially one-third of its circumference. The wheel at station A is cut out, as will be seen from Fig. 37, for substantially one-half of its circumference.

I will now refer to the mechanism at station B. Inasmuch as many of the parts at said station B are similar or substantially similar to the parts at station A, said similar parts at station B will be designated by the same reference-numerals as at station A, and the same will be true in regard to the similar parts at station C when said station C is taken up in its regular order. Figs. 3, 10, 11, 12, and 13 most clearly show the aggrouped parts at station B, although some of the details at

said station are shown in other views. As just stated, many of the parts at station B are similar or substantially similar to corresponding parts at station A, although in some instances the constructions are somewhat modified, although the functions performed are the same. These modifications will now be pointed out.

In the first place it will be noticed that the movable bracket 158 is somewhat different in shape from the corresponding bracket at station A in that said bracket 158 at station B merely consists of a single arm provided at its end with an angular lug 165, extending upwardly from the bracket. The bracket is also secured to a lower point of the upright 43 than the corresponding bracket 158 at station A is secured to the upright 42. As the body-label is attached to the bottle at station B, the label-drum 130 at station B is longer than the corresponding drum at station A. For the same reason the cutting mechanism at station B is also necessarily longer, and therefore the lower end of the piston of said cutting mechanism is supported on the framework at a lower point than is the piston of the cutting mechanism of station A. This is also made necessary by reason of the position of the label-drum with relation to the table. In fact, most of the parts at station B are required to be lowered, except the friction 124, which at each of the stations A, B, and C is in the same horizontal plane. Attention is furthermore directed to the fact that the label-drum 130 at station B is driven in a somewhat different manner than at station A. It will be remembered that at station A the label-drum was driven by a train of gears between the axis or shaft of friction-wheel 124 and the axis or shaft of the label-drum 130. At station B this train of gears is omitted entirely and the friction-wheel 124 is mounted on the same shaft or axis as the label-drum. This simple form of connection directly from the friction-wheel 124 to the label-drum at station B could not be used at station A in view of the fact that the center of the friction 124 is a fixed point in relation to the driving-friction 210, and the center of the label-drum is a fixed point in relation to the surface of the bottle to which the label is to be affixed. These two points not being in the same line at station A, it is necessary to connect them by the train of gears shown at said station A, while at station B this is not necessary, because the center of the friction 124 and the label-drum may be in line and are therefore so arranged. The same arrangement of the train of gears as shown at station A is also necessary at station C for the same reason as given above and will be clearly understood when the mechanism at station C is described.

Owing to the fact that the labels are transferred to the bottle by the winding of the paper on the bottle and the unwinding of the paper from the drum, it is necessary that the surface speed of rotation of the label-drum and bottle be the same or approximately the same. In the case of the mechanism at station B this is accomplished by having the largest diameter of the friction 58 approximately of the same diameter as the bottle and the friction 124 of approximately of the same diameter as the label-drum. Inasmuch as the friction-wheel 210 merely transfers the rotation of wheel 58 to wheel 124, it will necessarily follow that the speed of the surface rotation of the label-drum will be the same as the speed of surface rotation of the body of the bottle. At station A, however, the label is applied to the neck of the bottle, and consequently it becomes necessary to have the surface speed of the drum conform to the surface speed of the neck of the bottle. This is accomplished at station A by making the friction 124 of such diameter as to cause the surface speed of rotation of the label-drum to equal the surface speed of rotation of the neck of the bottle.

I will now proceed to describe station C. While the label-drum and cutting mechanism at this station are similar in construction to the same mechanisms at station A, yet they are slightly greater in length than the length of said parts at station A, but of less length than the corresponding parts at station B. It will be understood that at station C instead of applying labels to the bottles tin-foil is applied to the upper portion of the neck of each bottle, and by reason of this fact the pasting mechanism is constructed somewhat differently. In describing the pasting mechanism at station A, I merely designate the pasting-roller by the numeral 204 without describing the specific construction thereof. Inasmuch, however, as the specific construction of said pasting-roller at stations A, B, and C is the same, I will now refer to the parts thereof specifically.

A section of the roller at station A is shown in Fig. 27 and a section of said roller for station C in Fig. 30. The roller is composed of two sections, an inner section provided with a series of radial openings, which at their inner ends communicate with corresponding grooves in the hollow spindle of the paste-roller, said grooves in turn having openings leading therefrom to the interior of the hollow spindle. The other section of the roller is composed of a suitable porous material which surrounds the inner section. This porous material is for the purpose of absorbing the paste from the radial openings of the inner section and for spreading said paste over the surface of the label. This specific construction is common to the paste-rollers at stations A, B, and C, and in order to feed the paste to the hollow spindle a feed-pipe 219 extends from any suitable source of supply. (See Fig. 27.) At station C, however, the mechanism above the paste-roller is somewhat different than at the stations A and B, the construction above the paste-roller at station B being similar to the construction at sta-

tion A, as shown in Fig. 27. The construction at station C is shown in Fig. 30 and consists of a roller 220, mounted on a depending boss 221 from a collar 222, which is fast on the spindle. Another collar 223 bears against the lower end of the depending boss 221 of collar 222. It will be seen that the roller 220 bears against the surface of the label-drum, being held in engagement therewith by the spring 207, similar to the correspondingly-numbered spring at station A, said spring bearing against the swinging arm 195, similar to the swinging arm hereinbefore described. At stations A and B it will be understood that the paste-rollers are in contact with the surfaces of the label-drums at all times, so as to continuously supply paste to the paper. At station C, however, where tin-foil is affixed, it is desirable to apply the paste only at the forward end of the tin-foil, which has been severed from the main body of the tin-foil. It is for this reason that I provide the roller 220, which rides on the surface of the label-drum and normally holds the paste-roller out of contact with said label-drum. The label-drum, however, is provided at certain points with grooves 224, into which the roller is adapted to successively pass. At the moment said roller enters the groove the paste-roller comes in contact with the surface of the label-drum and supplies the paste to the tin-foil. It will be noticed that these grooves commence at about a point just above the upper ends of the cutting-notches and extend circumferentially for a short distance. This is for the purpose of pasting the front end only of the tin-foil. I do not wish to limit myself to applying the paste exactly to the front end of the tin-foil, however, or along the tin-foil for any certain or definite length, as the paste may be applied to said tin-foil at any desired point and have any desired length, and this is also true in regard to the labels, if for any reason it may be found necessary to paste parts of a label only, and where this is done in the case of stations A and B of course the same mechanism as used at station C and as shown in Fig. 30 will be employed at said stations A and B.

It will be understood that the same form of spool and the same form of roller adjacent to the label-drum are employed at station C as at stations A and B and are designated by the same reference-numerals. There is also certain mechanism which is shown at stations A, B, and C and which has not heretofore been referred to. I will first describe this particular mechanism, which is located at station C. Said mechanism consists of a certain combination of parts with the friction cam-wheel 124. The cams of this cam-wheel are indicated by the numerals 225, there being in the present illustration of my invention three of such cams. Secured to the housing in which the cam-wheel is located is a casing 226 for a spring-actuated pin 227. The tension of the spring is regulated by means of a set-screw 228. The inner end of the spring-actuated pin is pointed or conical and is adapted to be forced into a correspondingly-shaped recess 229 in the periphery of the cam-wheel 124 whenever said recess is brought into register with the end of the pin during the revolution of the cam-wheel. There are in the present illustration of my invention three of these conical recesses, corresponding in number to the number of cam-surfaces. In the upper surface of the table 51, at the peripheral edge thereof, are formed a series of recesses 230, which are in a radial line through the axis of the table and the axis of the friction-wheel 58.

The numeral 231 indicates a pawl which has its pivot-point located at or near station D, the pivot being shown in Figs. 18 and 20. The free end of the pawl rests on the upper surface of the table during the rotation of the table to bring the bottles from one station to the other. The point of the free end of the pawl is on a line coincident with the axes of the friction cam-wheel 124, friction-wheel 58, and the table. As the table revolves this pawl will drop into the first recess 230 of the table which presents itself, and when the pawl thus engages said recess the frictions 58, 210, and 124 are in operative position. This will set the friction-cam 124 in motion revolubly. By the revolution of this cam-friction the label-drum, which is connected thereto in the manner hereinbefore pointed out, is also rotated, the friction-cam being rotated a sufficient distance to rotate the label-drum sufficiently to permit the label to be blown from said label-drum onto the bottle. During the time of putting on the label the friction-cam 124 in the construction shown is rotated about one-third of a revolution, which is sufficient to cause one of the cams 225 to raise the pawl out of engagement with the recess 230 of the table. The pawl is now resting on top of one of the cams 225 and would not engage the next recess of the table unless released from said cam. The pawl is raised on top of this cam in view of the fact that the table is released and has commenced its rotation and the working face of the friction 210 has passed by the working face of the friction 124. In order to effect the release of the pawl from the cam-surface, the conical recesses 229 are preferably so arranged that one of said recesses is always diametrically opposite the highest point of one of the cam-faces 225. The pin 227 is also so positioned that the point of said pin rests on one of the walls of the recess 229 at this time, and as said pin is forced inwardly by the action of the spring bearing against the same the friction 124 is given a slight rotation, which rotation is sufficient to cause the highest point of the cam-face to pass beyond the end of the pawl 231, which permits said pawl to again drop onto the surface of the table in position to engage the next succeeding recess 230 of the table. Fig. 19 shows the pin 227 in en-

gagement with the recess 229 and the pawl 231 as having been raised and resting on the surface of the table. In order to make the construction of the pawl entirely clear, attention is called to Fig. 20, which shows that said pawl has its free end bent downwardly, so that the moment the highest point of the cam-face 225 is revolved by the downwardly-bent end of the pawl said downwardly-bent end will rest on the table. It will be seen from Fig. 18 that the pawl is adjustable longitudinally. This adjustment is preferably provided so as to bring the free end of said pawl on a line coincident with the axes of the friction-cam 124, friction-wheel 58, and the table 51. It will be noticed that the pivot of the pawl is a pin 232, which is mounted in ears 233, extending upwardly from a plate 234, said plate provided with elongated slots 235 235, through which screws 236 236 pass and enter an under plate 237. An adjusting-screw 238 passes through an upwardly-extending lug 239, and said screw engages the end of the plate 234.

In the present illustration of my invention the friction-cam 124 at station C is only used to operate the pawl 231 and allied mechanism. I, however, duplicate the cam 124 at stations A and B. At station A, I have also shown the spring-actuated pin 227, but at station B have omitted this pin. The reason for duplicating the friction-cam and allied mechanism at stations A and B is that it may be desired to use one, two, or all three stations, according to the number and kind of labels to be put onto the bottles. In case stations A and C are not needed—that is to say, if the machine is only desired for attaching one label—station C could be removed and station B put in place thereof, and thus the friction-cam would operate the pawl in a similar manner as explained in regard to the friction-cam at station C. In case it is required only to put on two labels, the mechanism at station C can be removed and the mechanism at station A transferred thereto.

The spring-actuated pin similar to 227 is omitted at station B. The only essential function this pin could perform at station B would be to give the friction-cam a sufficient rotation to release the pawl 231. The spring 208 hereinbefore referred to, which bears against the upper surface of the label-drum of station B, however, serves to give a sufficient rotation to the friction cam-wheel to release the cam-face thereof from the pawl 231, and hence it is unnecessary to duplicate the spring-actuated-pin construction at station B. This spring 208 could not perform this function at stations A and C, owing to the lost motion engendered by the train of gears belonging to said stations A and C. Furthermore, at stations A and C the spring works to a disadvantage on account of the leverage occasioned by the action of larger diameters of the friction-cam wheels at said stations A and C.

The mechanism at station D will now be described.

The pulley 113 hereinbefore referred to is mounted on an upright shaft 240, which shaft carries at its upper end a burnishing-brush 241. After one of the bottles has been carried past station C by the revolving table said bottle is next stopped at station D. The burnishing-brush 241 is so located as to engage the upper portion of the neck of the bottle when said bottle is thus stopped at station D, and the function of this brush is to smooth the tin-foil which is applied at station C around the upper portion of the neck of the bottle and at the same time incidentally polish or burnish said tin-foil. The burnishing-brush is of course shaped to conform to the shape of the neck of the bottle at the point of the bottle it operates on. It will also be understood that at station D the label-brushes 118 119 120 are operating, respectively, on the body-label, neck-label, and tin-foil at the same time that the burnishing-brush is operating at said station D, but that at this station D the label-brushes and tin-foil brush are rotated in an opposite direction to the direction of their rotation at stations A, B, and C and that also the bottle which is at station D is rotated in an opposite direction to the direction in which it was rotated at the other stations. It will be understood, however, that at all the stations the surfaces of contact of the brushes and the bottles are traveling in the same direction notwithstanding the fact that they are rotated in opposite directions. The reversing of the direction of rotation of the brushes and bottles at station D forms no feature of the invention, but is merely done in order to simplify the construction of the machine. The belting of the machine also causes the burnishing-brush 241 to rotate in the opposite direction to the direction of rotation of the bottle, so as not to raise the terminal end of the tin-foil. The shaft 111, which carries the pulley 110, has also mounted on its upper end a friction-wheel 242, which is formed with a beveled under face, which is adapted to bear upon the upper beveled or conical face of the friction-wheel 122 at the lower end of the brush-spindle 115. It will be understood that the shaft 111 is capable of a slight vertical play in its bearings and at its lower end has fixed thereto two tight collars 243 243′ and an intermediate loose collar 244. This loose collar is formed at diametrically opposite points with recesses 245 245. The upper and lower edges of these recesses are of conical form and the apices of the cones are opposite. (See Figs. 32 and 33.) One end of a flat spring 246 is bifurcated and the furcate parts fit in these recesses. The opposite end of this spring is secured to a fixed part, as clearly shown. The object of this spring is to hold the shaft 111 down to its normal position, as shown in full lines in Fig. 32. The shaft 111 is located at such position at station D that as the brushes and

their friction 122 are carried with the table to the station D each friction 122 will be successively brought into engagement with the friction 242. The first engagement of the friction 122 will be such that the edge of said friction 242 will first come into engagement with the outer edge of friction 122 and will gradually ride up the beveled upper side of friction 122 to its working position. This movement is permitted in view of the fact that the shaft 111 has a vertical play in its bearings, and said shaft is thus moved upwardly against the downward action of the spring 246. The object of this is to relieve the parts of the jar which would otherwise occur if the frictions were suddenly thrust into complete working engagement. When the friction 122 of the brush-spindle is released from its engagement with the friction-wheel 242, the spring 246 acts downwardly on the shaft 111, so as to return said shaft to its normal position ready for the next friction 122.

The general operation of my machine will now be explained.

In the first place the pulley 88 is rotated by the driving-belt 89, and said pulley 88 in turn drives the belt 90. This by means of the described connection drives the pulleys 93, 106, and 108. As these pulleys are revolved the friction-pulleys 102, which are mounted on the same axes as the first-mentioned pulleys, are also rotated, and these pulleys 102, inasmuch as they contact with the pulleys 57, drive said pulleys 57. The pulleys 57 are at the lower ends of the spindles 55 and rotate said spindles 55, and as said spindles 55 carry the sockets 59 rotation is imparted to said sockets and the bottles mounted therein. The beveled frictions 58, carried by the spindles 55, are also necessarily rotated. It will be understood that the friction-wheels 57 on the bottle-spindles are in frictional contact with the friction-wheels 121 on the brush-spindles, so that said brush-spindles are also rotated. Inasmuch as the several frictions of the bottle-spindles are only rotated at stations A, B, and C by the frictions 102, the rotation of the bottle-spindles and the brush-spindles occurs only as the table is revolved, so as to bring the frictions of bottle-spindles successively into engagement with the frictions 102 at stations A, B, and C. The cam-wheels at stations A, B, and C are rotated by means of the engagement of the friction-wheels 58 at the upper ends of the bottle-spindles 55 engaging the double cam-wheel 210 whenever the acting surface of said cam-wheel engages the friction 124. The function of these friction cam-wheels 124 has already been fully explained. As the cam-wheels 124 are put in motion it necessarily follows that the label-drums are rotated, inasmuch as said drums are connected to said friction cam-wheels 124 in the manner previously explained. By the rotation of the label-drum motion is transferred to the roller 193, which draws the paper from the paper-spool onto the label-drum, the paper being held to said drum by means of the suction hereinbefore described. It will be readily seen that when the working surface of the double friction-wheel 210 passes the beveled surface of wheel 124 and the cut-away portion 211 has reached the beveled surface of wheel 124 the rotation of the label-drum will cease and the spring 208 will engage one of the notches 209 of said label-drum, thereby positioning the drum, as before explained, and permitting the cutting mechanism to act in the manner also hereinbefore fully explained. After the label is cut off the next operation is the pasting of the label. The paste-roller is rotated by the gear 200 on the drum and the train of gearing 199, 197, and 202, the paste dropping from the tube 219 into the hollow spindle 201, thence through the openings of said spindle and the surrounding roller, and is taken up by the absorbing material which surrounds said roller, and the paste is applied by said absorbing material to the label when the drum is in motion. It will be understood that the label is being cut off at the time the table is in motion, or, in other words, when one of the bottles is being carried from one station to the other, so that immediately upon the arrival of the next bottle at the station the label, with the paste thereon, is ready to be blown onto the bottle, the blast, hereinbefore described, forcing first the end of the label to the bottle or receptacle and then the succeeding parts of the label to said bottle or receptacle. As soon as the pasted ends of the labels which have been applied to the bottles reach the brushes said brushes will act on the labels and smooth them closely to the bottles. The tin-foil, which is designated in the drawings by the numeral 247, is applied to the neck of the bottle and is brushed in the same manner. The table is rotated by means of the pinion 112 at station D engaging the gear-wheel 48, and while the friction-wheel 48 is continuously rotated the rotation of the table is intermittent by reason of the engagement of the pawl 231, which stops the table, so that the different bottles to be acted upon will be successively stopped at the different stations. It will also be understood that at station D the label-brushes and the tin-foil brush again come into play and finally smooth the labels and that the additional brush 241 burnishes or polishes the tin-foil.

The brushes are rotated at station D by means of the beveled frictions 122 coming into contact with the friction-wheel 242 in the manner hereinbefore explained, and the moment the brush-spindles are thus rotated their rotation is conveyed to the bottle-spindles.

While I have herein shown and described certain forms of construction for various parts of the machine, yet I do not wish to be understood in any sense as restricting myself to details of construction, as it will be appar-

ent that various parts may be changed or modified without departing from the spirit and scope of my invention. The particular form of framework is of course non-essential. It is also not necessary that any particular direction of rotation of the bottles, brushes, &c., should be imparted thereto. Again, it is not absolutely necessary to restrict myself to the particular arrangement of the openings 140 in the label-drum—that is, said openings in vertical alinement—inasmuch as it may be desirable to employ my machine for applying different-shaped labels to bottles. In such case, of course, the openings referred to would be so arranged as to direct the blast onto the peculiarly-shaped label without waste of air or loss of vacuum. For instance, a diamond-shaped label is frequently applied to bottles. Under such circumstances the openings 140 could be arranged accordingly and the continuous strip of paper, with the labels thereon, could be made of diamond-shaped portions connected by a narrow strip, which strip could be severed by the cutting mechanism. Again, I wish it understood that my invention is not necessarily restricted to a plurality of stations, inasmuch as where only one label is desired to be attached to a bottle the machine could be constructed with merely a single station, or, again, where but two labels are desired to be attached but two stations need be employed, and even additional stations similar to A, B, and C may be employed where it is desired to attach more than three labels. Furthermore, the invention is not necessarily restricted to attaching labels to bottles, inasmuch as with slight variations it could be employed for attaching labels to cans or other receptacles.

I desire to call attention to the fact that in my machine the connection between the bottle-revolving mechanism and the label-attaching mechanism is such as to produce a relative speed between the surface of the bottle and the surface of the label to be affixed to thereby cause said surface of the bottle and that of the label to travel at the same speed or approximately the same speed, preferably the label traveling at a slower speed than the bottle if there is any variation in the speeds. By this arrangement the label is caused to be applied smoothly to the bottle. I also desire to call attention to the fact that the detent 208, which engages the notch of the drum, has the effect of positioning the drum and in addition thereto also positioning the drive-wheel 124 for the drum. In cases where a separate detent, such as 227, is used to take up lost motion, as hereinbefore explained, said detent also acts incidentally to position the drive-wheel 124 without reference to the detent for the drum.

I do not wish to be understood as restricting my invention to the details of construction specifically described in the specification and shown in the drawings, inasmuch as it is obvious that modifications and variations may be made therein without departing from the spirit and scope of my invention.

What I claim as my invention is—

1. In a label-attaching machine, the combination, of a bottle or receptacle holding and carrying device, mechanism for automatically attaching a label or foil to the bottle or receptacle, and a separate revolving automatic smoothing device for smoothing the label or foil after attachment of said label or foil, said smoothing device being independent of the attaching mechanism, and carried with the bottle or receptacle.

2. In a label-attaching machine, the combination, of a bottle or receptacle holding and carrying device, means for rotating a bottle on the holding and carrying device, a plurality of stations, mechanism at each station for attaching a label to a bottle or receptacle, and smoothing mechanism carried by the bottle or receptacle holding and carrying device, said smoothing mechanism being independent of and separate from, but coöperating with the attaching mechanism, whereby the labels after being attached are smoothed at the respective stations.

3. The combination, of a bottle or receptacle holding and carrying device, mechanism for attaching tin-foil to the bottle or receptacle, means for revolving the bottle, a terminal smoothing device for smoothing the tin-foil, after said tin-foil is attached to the bottle, and means for stopping the bottle holding and carrying device at the point of location of the smoothing device, whereby the axis of the bottle has the same relative relation to the position of the smoothing device during the smoothing operation.

4. The combination, of a bottle or receptacle holding device, mechanism for attaching a tin-foil to the bottle or receptacle, and a smoothing device independent of and separate from the attaching mechanism and acting on the tin-foil at the same time the attaching mechanism is acting thereon, whereby the attaching mechanism holds the foil during the operation of the smoothing device.

5. In a label-attaching machine, the combination, of a table carrying a plurality of bottles or receptacles, said table having a series of catches at predetermined distances apart therearound, actuating mechanism continuously acting on the table, but permitting said table to be intermittently stopped without stoppage of said actuating mechanism, a station, an automatically-operating stop adapted to successively engage the catches of the table and thereby intermittently stop the movement of the table, said stoppage of the table being at such points that the bottles are successively brought into position at the station, mechanism at said station for attaching labels successively to the bottles when they arrive at the station, and mechanism acting on the stop, when the labeling opera-

tion is completed at a station, to release said stop from a catch, and thereby permit of further movement of the table.

6. In a label-attaching machine, the combination, of a revoluble table carrying a plurality of bottles or receptacles, a series of brushes also carried by the table, a plurality of stations, mechanism for intermittently stopping the rotation of the table at the various stations, mechanism at said stations for attaching the labels successively to the bottles, when said bottles arrive at the stations, and mechanism for revolving the bottles as the bottles arrive at the stations, the brushes at this time smoothing the labels onto the bottles.

7. In a label-attaching machine, the combination, of a table, a friction-wheel on which the table is supported and is normally revoluble therewith, but is adapted to be held against rotation while the friction-wheel is continuously rotated, and means for driving the friction.

8. In a label-attaching machine, the combination, of a table, a friction-wheel on which the table is supported and is normally revoluble therewith, means for driving the friction, and means for stopping the table without interfering with the continued rotation of the friction.

9. In a label-attaching machine, the combination, with a bottle or receptacle carrying table, of means for automatically centering and holding the bottle or receptacle first at its upper end and finally at its lower end.

10. In a label-attaching machine, the combination, of a bottle or receptacle holding table, a centering device for one end of a bottle or receptacle, said centering device having an opening extending therethrough, a centering-pin fitting said opening, and means for longitudinally actuating said centering-pin.

11. In a label-attaching machine, the combination, of a bottle or receptacle holding table, a centering device for one end of the bottle or receptacle, said centering device having an opening extending therethrough, a centering-pin fitting in the opening, a lever having one end connected to the pin, and means for operating said lever, whereby the pin is forced downwardly and permitted to return to its initial position.

12. In a label-attaching machine, the combination, of a bottle or receptacle holding table, a centering device for one end of the bottle or receptacle, said centering device having an opening extending therethrough, a centering-pin fitting in the opening, a lever having one end connected to the pin, said lever carrying a roller at its free end, a cam-surface over which the roller rides, whereby the pin is forced downwardly directly by the lever, and means for raising the pin.

13. In a label-attaching machine, the combination, of a bottle or receptacle carrying device, said device having a frame at a distance from the same, centering mechanism carried by the frame, holding mechanism carried by the carrying device, said centering and holding mechanisms adapted, respectively, for automatically centering the bottle at one end, and forcing the bottle and thereby holding the opposite end of said bottle to the carrying device, and means for automatically releasing the holding mechanism.

14. In a label-attaching machine, the combination, of a bottle or receptacle holding table provided with an opening, a spindle having one end fitting the opening of the table, said end of the spindle adapted to receive the end of a bottle, and said spindle provided at its opposite end with a wheel, a brush-spindle carried by the table, said spindle carrying a wheel meshing with the wheel of the bottle-spindle, and means for driving the brush-spindle on the table.

15. In a label-attaching machine, the combination, with a revoluble bottle or receptacle holding table provided with an opening, a spindle having one end fitting the opening in the table, said end of the spindle adapted to receive the end of the bottle, and said spindle provided at its opposite end with a wheel, a brush-spindle carried by the table, said spindle carrying a wheel meshing with the wheel of the bottle-spindle, a plurality of stations, means for stopping the table at each station, and means at each station for rotating one of the wheels.

16. In a label-attaching machine, the combination with a revoluble bottle or receptacle holding table provided with a series of openings, spindles, each having one end fitting an opening in the table, said end of the spindle adapted to receive the end of a bottle, and said spindle provided at its opposite end with a wheel, brush-spindles carried by the table, each of said spindles carrying a wheel meshing with the wheel of a bottle-spindle, a plurality of stations, means for stopping the table as each bottle arrives at a station, and means at each station for rotating one of the wheels of each set, so as to simultaneously rotate all the bottles and brushes of the series.

17. In a label-attaching machine, the combination of a bottle or receptacle holding device, means for revolving a bottle or receptacle thereon, an automatically-operating drum, and means in conjunction therewith to automatically hold the label or foil to the drum and to automatically expel the label or foil from the drum in such manner as to provide for the proper affixing of said label or foil to the revolving bottle.

18. In a label-attaching machine, the combination, of a movable table, a revoluble label-carrying drum, said drum provided with a notch, a fixed station, means for stopping the table at the station, and a detent at the station and adapted to engage the notch of the drum in order to position said drum.

19. In a label-attaching machine, the combination, of a revoluble label-carrying drum,

a glue-roller, and an uneven surface adapted to act directly on the axis of the glue-roller, whereby said roller is held in or out of contact with the label on the drum.

20. In a label-attaching machine, the combination, of a revoluble label-carrying drum, a glue-roller, a roller mounted on the axis of the glue-roller, and an uneven surface adapted to act on said roller which is mounted on the axis of the glue-roller, whereby the glue-roller is held in or out of contact with the label on the drum.

21. In a label-attaching machine, the combination, with a bottle or receptacle holding device, of an automatically-operating rotatable drum, and means in conjunction therewith to automatically hold the label to the drum and to automatically expel the label from the drum in such manner as to provide for the proper affixing of said label to the bottle.

22. In a label-attaching machine, the combination, with a plug having inlet and exhaust passages, a label-drum surrounding said plug and having openings in communication with the inlet and exhaust passages of the plug, and mechanism for feeding an agent, such as air, whereby the exhaust forms a suction to hold the label to the drum, and the inlet forms a blast to force the label away from the drum.

23. In a label-attaching machine, the combination, of a plug having inlet and exhaust passages, a label-drum surrounding said plug and adapted to revolve around the plug, and said drum having openings which are adapted, as the drum revolves, to be brought into register with the inlet and the exhaust passages of the plug, and mechanism for feeding an agent, such as air, whereby the exhaust forms a suction to hold the label to the drum, and the inlet forms a blast to force the label away from the drum.

24. In a label-attaching machine, the combination, of a plug having an inlet-passage, of a revoluble drum surrounding the plug and provided with one or more openings adapted to be brought into register with the inlet-passage of the plug, whereby the label carried by the drum is adapted to be blown off the drum onto the bottle to which it is to be attached.

25. In a label-attaching machine, the combination, of a plug having inlet and exhaust passages and a channel partly surrounding the plug, said channel being in communication with the exhaust, of a label-drum surrounding said plug and adapted to revolve around the plug, and said drum provided with a series of openings, some of which being in register with the channel partly surrounding the plug, and each of said openings being adapted to be brought successively into register with the inlet-passage of the plug.

26. In a label-attaching machine, the combination, of a plug having inlet and exhaust passages, and a channel partly surrounding the plug, said channel being in communication with the exhaust, of a label-drum surrounding said plug and adapted to revolve around the plug, and said drum provided with a series of openings, some of which being in register with the channel partly surrounding the plug, and each of said openings adapted to be brought successively into register with the inlet-passage of the plug, and means for counterbalancing the force exerted by the blast and the suction acting in substantially the same direction.

27. In a label-attaching machine, the combination, with a revoluble drum adapted to receive a label-strip therearound, and constructed to be automatically stopped at certain intervals, of mechanism coöperating with the drum as said drum is automatically stopped, said mechanism adapted for severing a continuous label-strip into proper lengths for the labels.

28. In a label-attaching machine, the combination, with a revoluble drum adapted to receive a label-strip therearound, and constructed to be automatically stopped at certain intervals, said drum having a notch in its surface, of cutting mechanism adapted to engage the notch of the drum as the drum is automatically stopped, said cutting mechanism thereby cutting the strip.

29. In a label-attaching machine, the combination, with a revoluble drum adapted to receive a label-strip therearound, and constructed to be automatically stopped at certain intervals, said drum having a cutting edge, of cutting mechanism adapted to engage the cutting edge of the drum, as said drum is automatically stopped, the cutting mechanism thereby cutting the strip.

30. In a label-attaching machine, the combination, with a revoluble drum adapted to receive a label-strip therearound, and constructed to be automatically stopped at certain intervals, said drum having cutting edges arranged a desired distance apart, of cutting mechanism adapted to engage the cutting edges of the drum, as said drum is automatically stopped, the cutting mechanism thereby cutting the strip into proper lengths for the labels.

31. In a label-attaching machine, the combination, of a piston having inlet and exhaust passages therein, a cylinder surrounding the piston and having side channels communicating with the space between the piston and the cylinder-head, said inlet and exhaust passages being adapted to be alternately brought into communication with the side channels, means for rotating one of the parts, and a cutting-knife connected to one of the parts.

32. In a label-attaching machine, the combination, of a stationary piston having inlet and exhaust passages therein, a cylinder surrounding the piston and having side channels communicating with the space between the piston and the cylinder-head, said inlet and exhaust passages being adapted to be

alternately brought into communication with the side channels, means for rotating the cylinder, and a cutting-knife carried by the cylinder.

33. In a label-attaching machine, the combination, of a piston having inlet and exhaust passages therein, a cylinder surrounding the piston and having side channels communicating with the space between the piston and the cylinder-head, said inlet and exhaust passages being adapted to be alternately brought into communication with the side channels, a bracket engaging one of said parts, and means for reciprocating said bracket.

34. In a label-attaching machine, the combination, of a piston having inlet and exhaust passages therein, a cylinder surrounding the piston and having side channels communicating with the space between the piston and the cylinder-head, said inlet and exhaust passages being adapted to be alternately brought into communication with the side channels, a bracket engaging one of said parts, a revolving table against which the end of the bracket is held, said table provided with a series of recesses with which the end of the bracket is adapted to successively engage and pass out of, whereby the bracket is reciprocated and the cylinder thereby oscillated so as to bring the cutting mechanism into and out of operative position.

35. The combination, of a revoluble label-drum provided with a cutting edge at an angle to its circumference, a knife, means for swinging the knife so as to bring its cutting edge into and out of cutting position with the cutting edge of the drum, and means, when the cutting edge of the knife is brought into cutting position with the cutting edge of the drum, for progressively advancing said cutting edge of the knife, along the cutting edge of the drum.

36. The combination, of a label-drum provided with a notch, a cylinder, means for oscillating said cylinder, a knife carried by the cylinder and adapted, as the cylinder is turned in one direction, to have its cutting edge brought into cutting position with one of the walls of the notch of the drum and when said cylinder is turned in the opposite direction to have its cutting edge turned out of cutting position.

37. The combination, with a label-drum provided with a cutting edge across the circumference thereof, a cutting-knife and a movable and oscillating part carrying the knife, the oscillation of said part causing the knife to be brought into and out of cutting position with relation to the cutting edge of the drum, and the moving of said part causing the knife to be drawn across the label in order to cause a progressive cut of said label.

38. The combination, with a moving table provided with one or more stops, a pawl adapted to engage a stop and thereby stop the rotation of the table at a certain point, a cam-wheel adapted to act on the pawl to release said pawl from engagement with the stop, means for stopping the cam-wheel when the pawl is raised, and means for giving a slight rotation to said cam-wheel after the pawl is raised, so as to bring the cam-surface of the wheel out of engagement with the pawl, in order to permit said pawl to be in position to engage the next stop.

39. The combination, with a movable table provided with one or more stops, a pawl adapted to engage a stop and thereby stop the rotation of the table at a certain point, a cam-wheel adapted to act on the pawl to release said pawl from engagement with the stop, said cam-wheel provided with one or more notches, means for stopping the rotation of the wheel when the pawl is raised, and a pin adapted to engage a wall of the notch of the cam-wheel in order to give said cam-wheel a slight rotation so as to bring the cam-surface of the wheel out of engagement with the pawl, in order to permit said pawl to be in position to engage the next stop.

40. The combination, with a movable table provided with one or more stops, a pawl adapted to engage the stop and thereby stop the rotation of the table at a certain point, a cam-wheel adapted to act on the pawl to release said pawl from engagement with the stop, a revoluble wheel having a portion of its acting surface cut away, the non-cut-away portion thereof engaging the cam-wheel and rotating the same a certain distance, the rotation of said cam-wheel ceasing when the cut-away portion of the other wheel is opposite the surface of the cam-wheel, the stopping of the rotation of the cam-wheel occurring at the time the pawl is raised, and means for giving a slight rotation to said cam-wheel after the pawl is raised and the positive rotation of said wheel has ceased, so as to bring the cam-surface of the wheel out of engagement with the pawl, in order to permit said pawl to be in position to engage the next stop.

41. In a label-attaching machine, the combination, of a bottle or receptacle carrying device, a wheel carried by said bottle or receptacle carrying device, another wheel to be driven, and a gearing between the two wheels, said gearing having two contacting surfaces, the contacting surface which is adjacent to the wheel to be driven having a cut-away portion, the non-cut-away portion of said contacting surface adapted to intermittently rotate the wheel to be driven, and the other continuous non-cut-away surface of said gearing adapted to be intermittently engaged by the wheel carried by the bottle or receptacle carrying device, as said bottle or receptacle carrying device brings said wheel into position to engage the continuous non-cut-away portion of the gearing.

42. The combination, of a wheel, another wheel to be driven, and a gearing between the two wheels, said gearing mounted on an axis other than a vertical axis, and said gearing having two contacting surfaces, the contact-

ing surface which is adjacent to the wheel to be driven having a cut-away portion, the non-cut-away portion of said contacting surface adapted to intermittently rotate the wheel to be driven, and the other continuous or non-cut-away contacting surface of said gearing engaging the contacting surface of the other wheel, the said gearing being constructed to be returned to a normal position when its rotation ceases.

43. The combination, of a wheel, another wheel to be driven, a gearing between the two wheels, said gearing mounted on an axis other than a vertical axis, and said gearing having two contacting surfaces, the contacting surface which is adjacent to the wheel to be driven having a cut-away portion, the non-cut-away portion of said contacting surface adapted to intermittently rotate the wheel to be driven, and the other continuous or non-cut-away contacting surface of said gearing engaging the contacting surface of the other wheel, the said gearing being constructed to be returned to a normal position when its rotation ceases, and a pin adapted to engage the gearing in order to releasably hold said gearing at said normal position.

44. The combination, of shafts journaled in a suitable support and carrying intermeshing pinions, means for driving said pinions, a swinging arm, a paste-roll mounted in the swinging arm, said arm forming the bearing for the axis of the paste-roll, and said axis carrying a pinion in gear with the intermeshing pinions, of such relative size that the paste-roll is rotated by the train of gears and imparts to the paste-roll a surface speed greater than the surface speed of the drum, and means for yieldingly holding the paste-roll in contact with the drum.

45. The combination, with a revolving part, a shaft carried by said part, said shaft having a beveled friction-wheel mounted thereon, another shaft adapted to have longitudinal play in its bearing, said shaft carrying a beveled friction-wheel arranged in the path of the revolving part, whereby the beveled friction carried by the revolving part is brought into contact with the surface of the beveled friction carried by the other shaft, said beveled friction of the other shaft first contacting with the edge of the first-mentioned beveled friction, and then gradually riding up the beveled face thereof, and means, after the beveled friction carried by the revolving part is carried out of contact with the other beveled friction, for returning the shaft of the latter beveled friction to its normal position.

46. In a label-attaching machine, the combination, with a drum, said drum provided with a series of cutting edges around its circumference, and said drum adapted to have a label-strip passed therearound, means for automatically and intermittently stopping said drum, of cutting mechanism adapted to coact with the cutting edges on the drum, the length of the label, the circumference of the drum, and the cutting edges on the drum having a certain relative relation to each other, whereby the labels are measured in proper lengths on the drum, and severed in such proper lengths by the cutting mechanism.

47. In a label-attaching machine, the combination, with a carrying device adapted to carry a bottle or receptacle thereon, means for forcing a label to the bottle or receptacle at a fixed point, and for forcing succeeding parts of the label to the bottle or receptacle as said succeeding parts of the label approach the forcing means which is located at said fixed point, and means for holding the bottle or receptacle carrying device stationary during the labeling operation.

48. In a label-attaching machine, the combination, with a carrying device adapted to carry a bottle or receptacle, of means for directing a blast onto a label to thereby force, first, the end of the label to the bottle or receptacle, and then the succeeding parts of the label to said bottle or receptacle.

49. In a label-attaching machine, the combination, of a revoluble bottle or receptacle carrying device, a station having mechanism thereat for attaching a label to the bottle, a terminal station having mechanism thereat for effecting a final smoothing operation, and means for stopping the carrying device at the stations, the label being affixed when the carrying device is stopped and the bottle or receptacle brought to the initial station, and the final smoothing operation taking place when the table is stopped and the bottle or receptacle brought to the terminal station, and means at the terminal station for causing the smoothing device to act on the entire surface of the label.

50. The combination, with a bottle-revolving mechanism, of label-attaching mechanism connected with or driven from the bottle-revolving mechanism in such manner as to produce a relative speed between the surface of the bottle and the surface of the label to be affixed, to thereby cause said surface of the bottle and that of the label to travel at the same speed, or approximately the same speed.

51. In a label-attaching machine, the combination, of a movable table, a revoluble label-carrying drum, a driving-wheel for the drum, a fixed station, means for stopping the table at the station, and engaging means at the station constructed to position the drum and to also position the driving-wheel therefor.

52. In a labeling-machine, the combination, of a label-carrying device, a wheel, a movable part carrying said wheel, a wheel for driving the label-carrying device, and a gearing between the two wheels, said gearing having two contacting surfaces, the contacting surface which is adjacent to the driving-wheel for the label-carrying device having a cut-

away portion, the non-cut-away portion of said contacting surface adapted to intermittently rotate the driving-wheel for the label-carrying device, and the other continuous non-cut-away contacting surface of said gearing adapted to be intermittently engaged by the wheel carried by the movable part, as said movable part brings said wheel into position to engage the continuous non-cut-away portion of the gearing.

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

WILLIS S. SHERMAN.

Witnesses:

ARTHUR L. MORSELL,

ANNA V. FAUST.