

No. 890,734.

PATENTED JUNE 16, 1908.

J. N. TZIBIDES.

MACHINE FOR APPLYING CORK TIPS TO CIGARETTES.

APPLICATION FILED MAR. 25, 1907.

9 SHEETS—SHEET 1.

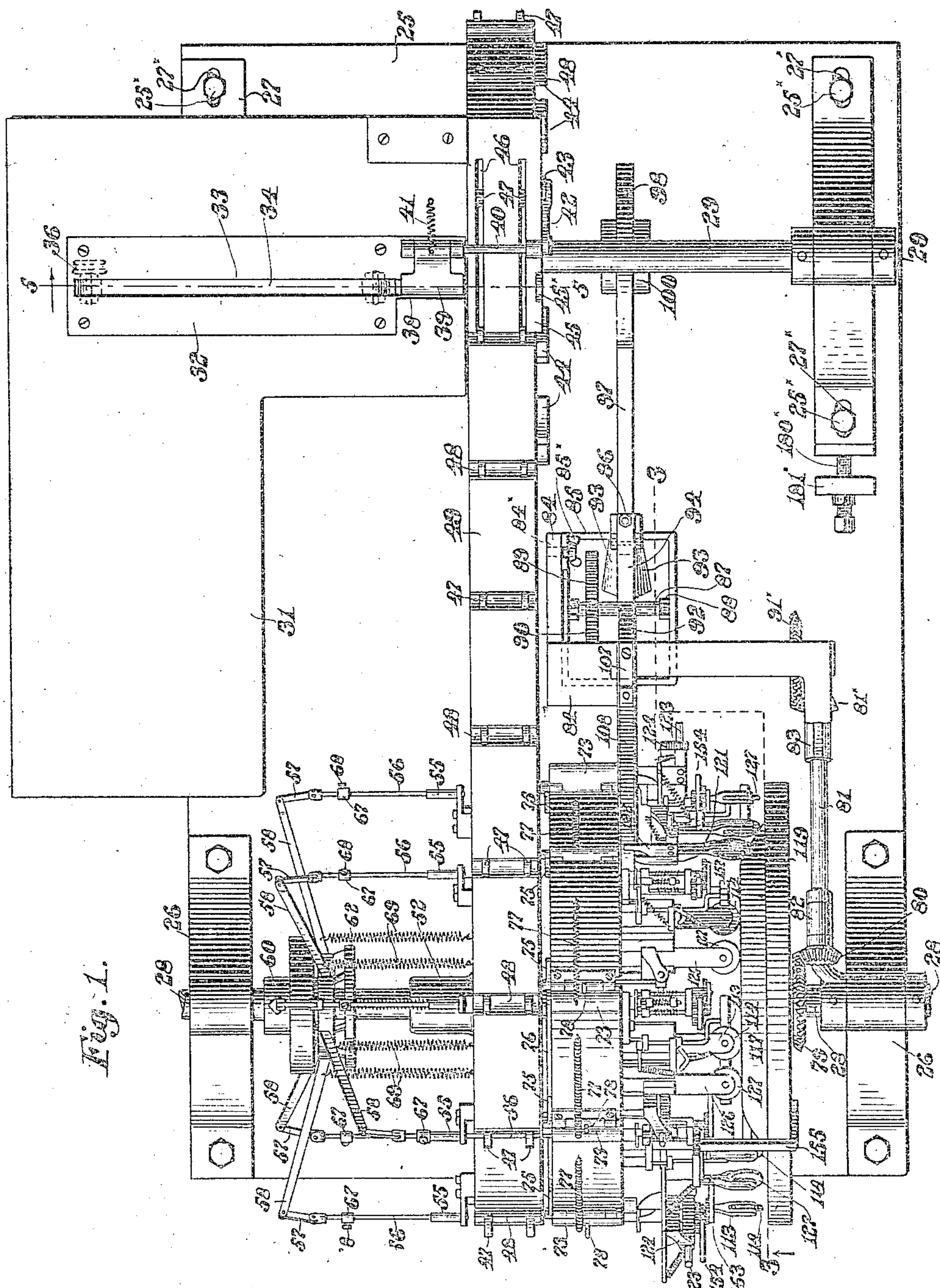


Fig. 1.

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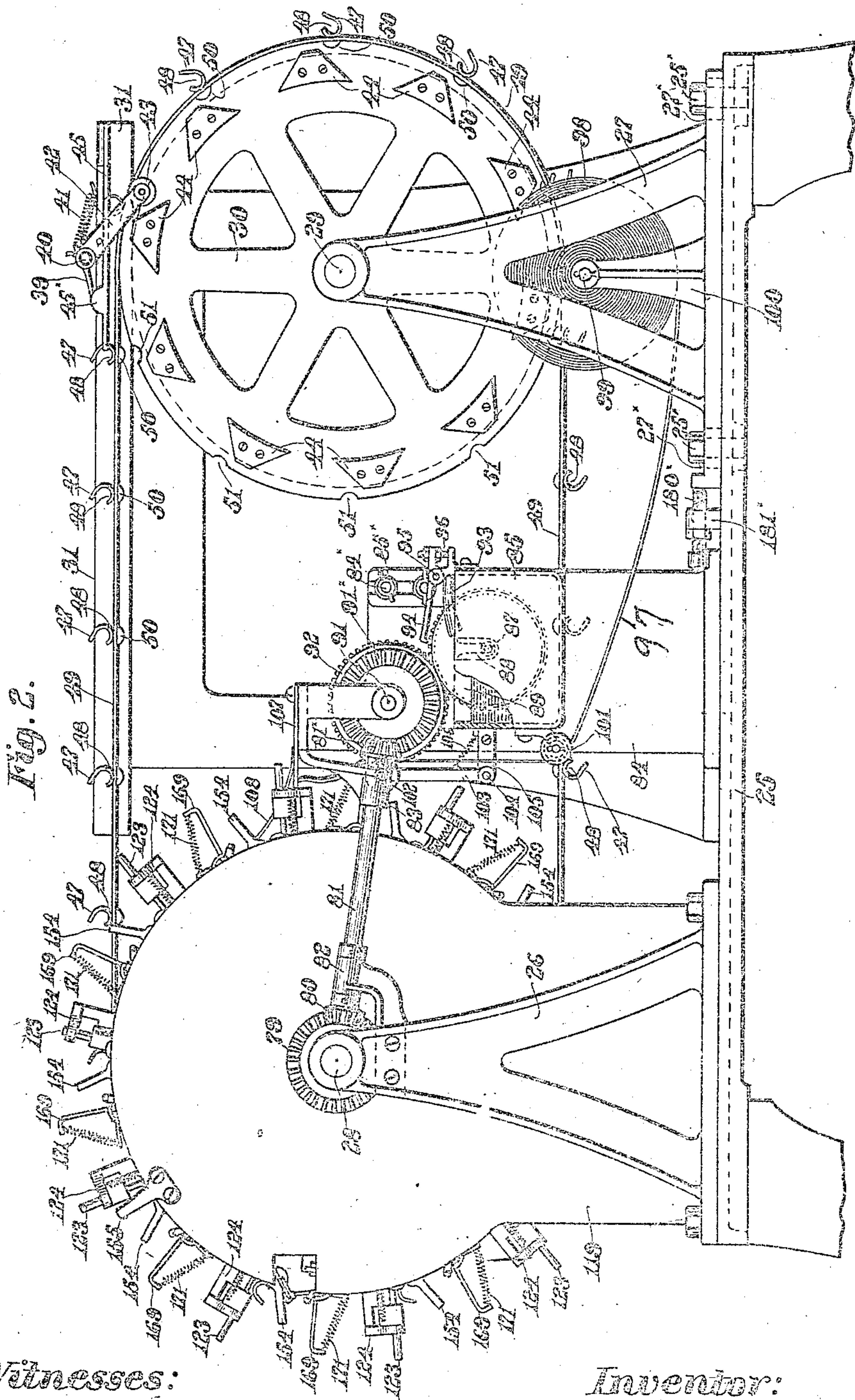


Fig. 2.

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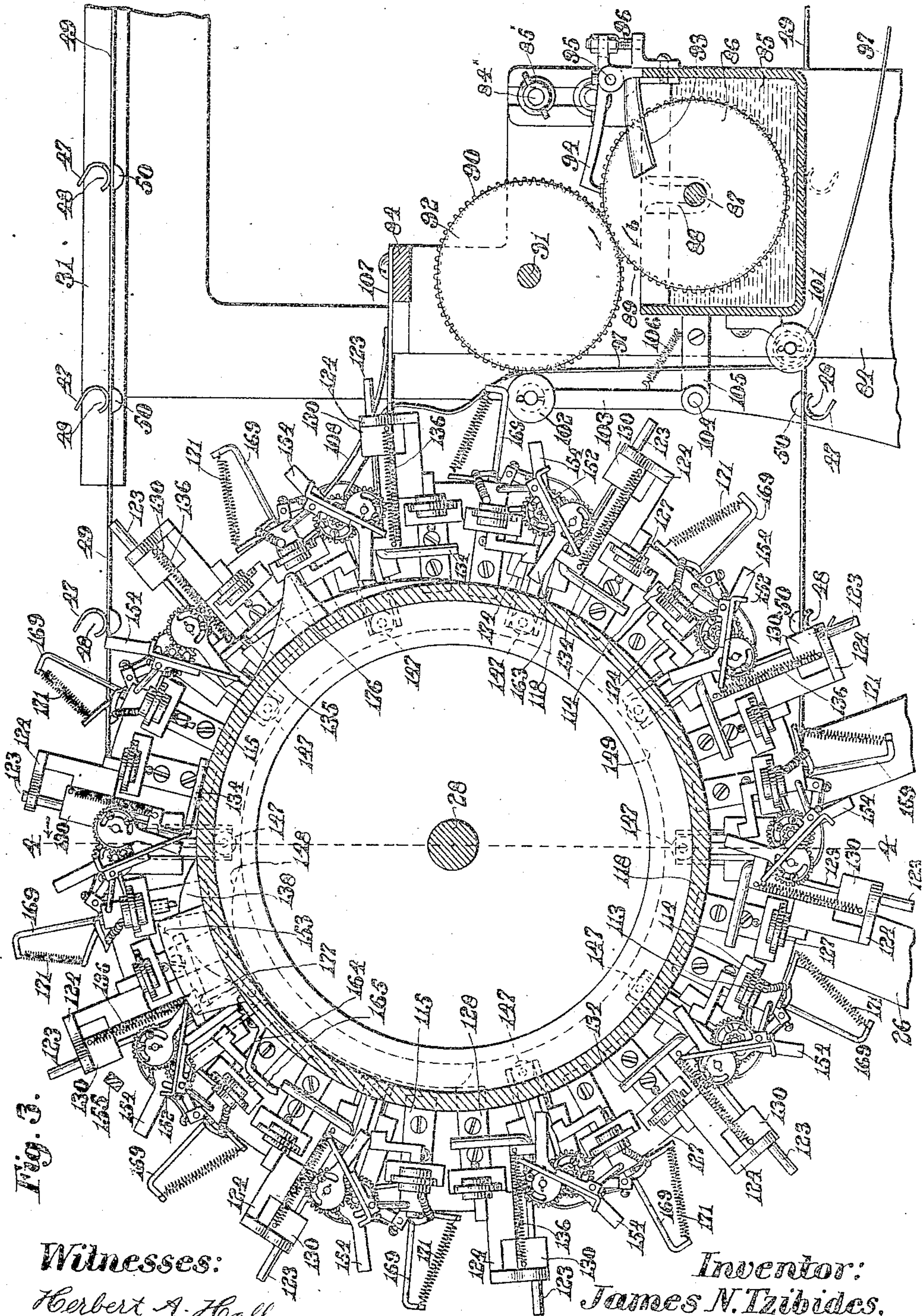
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9 SHEETS--SHEET 3



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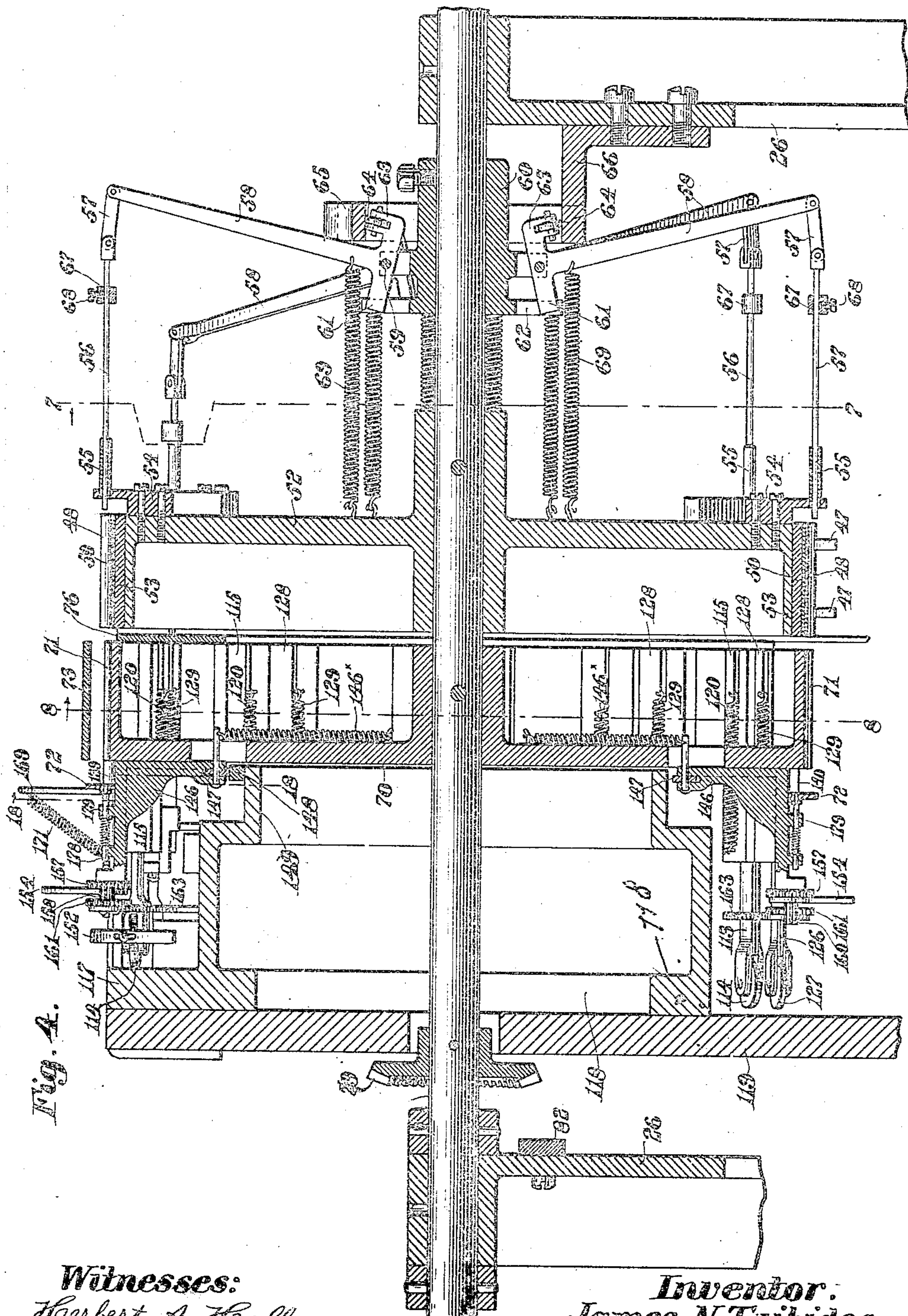


Fig. A.

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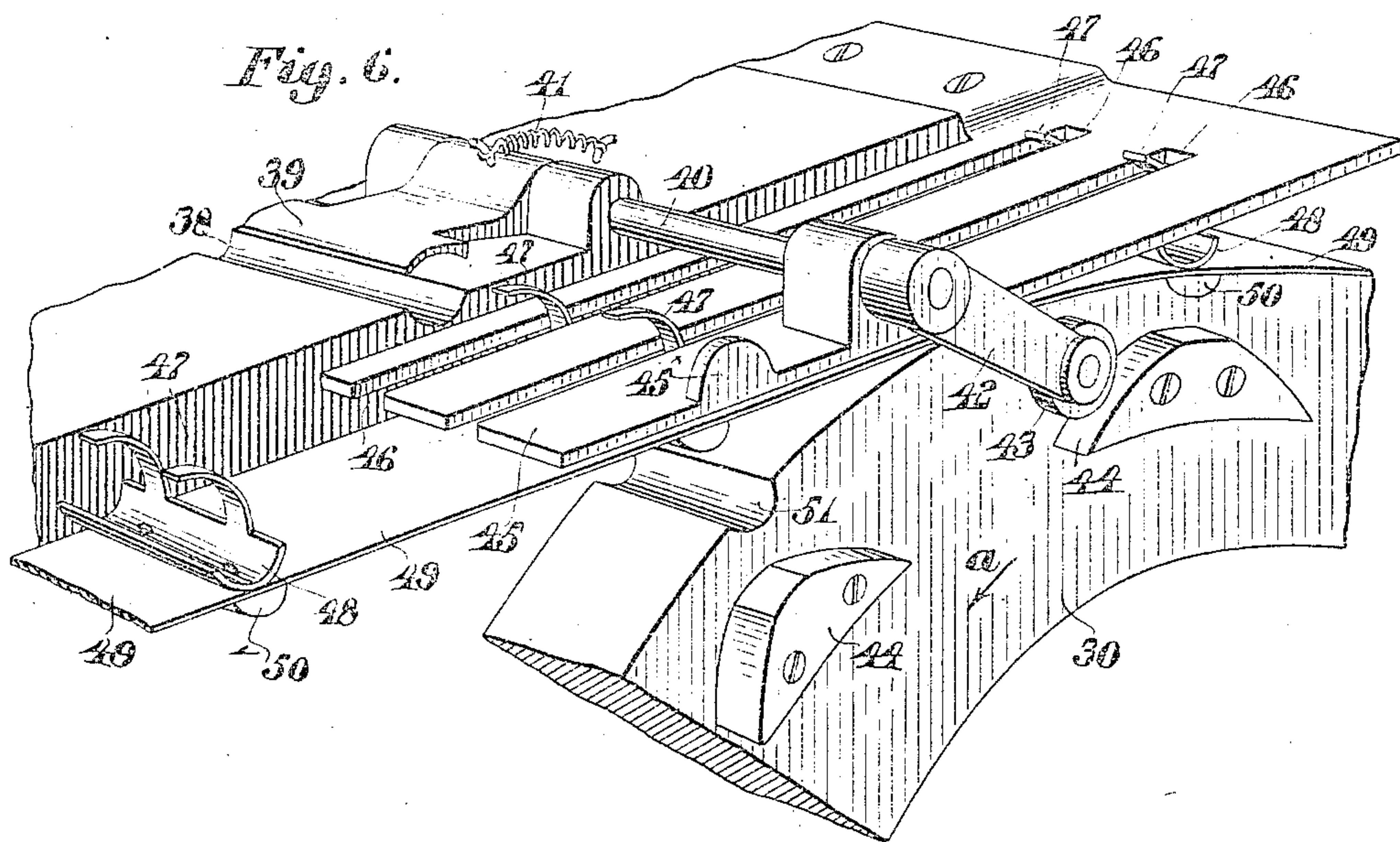
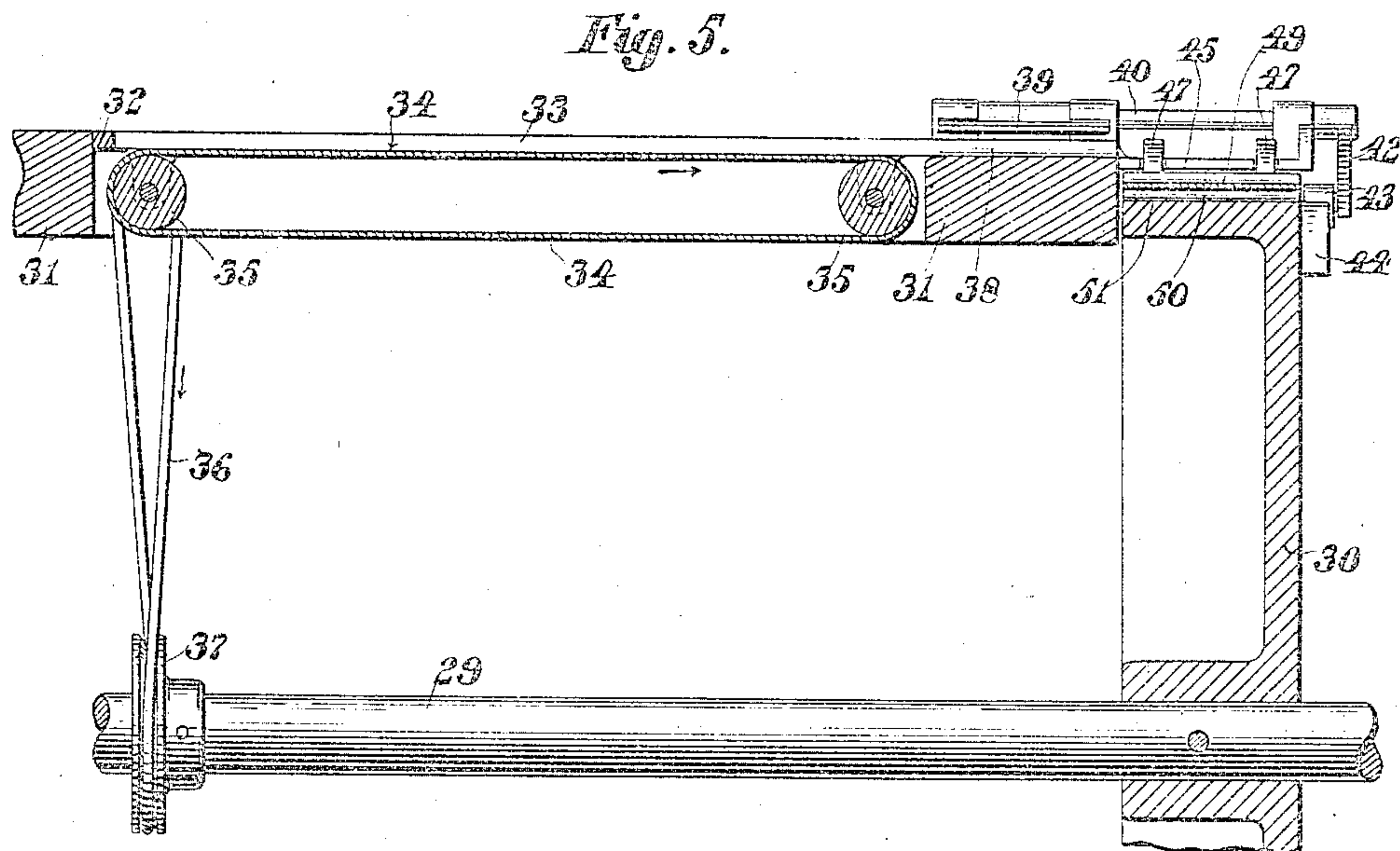
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9 SHEETS—SHEET 5.



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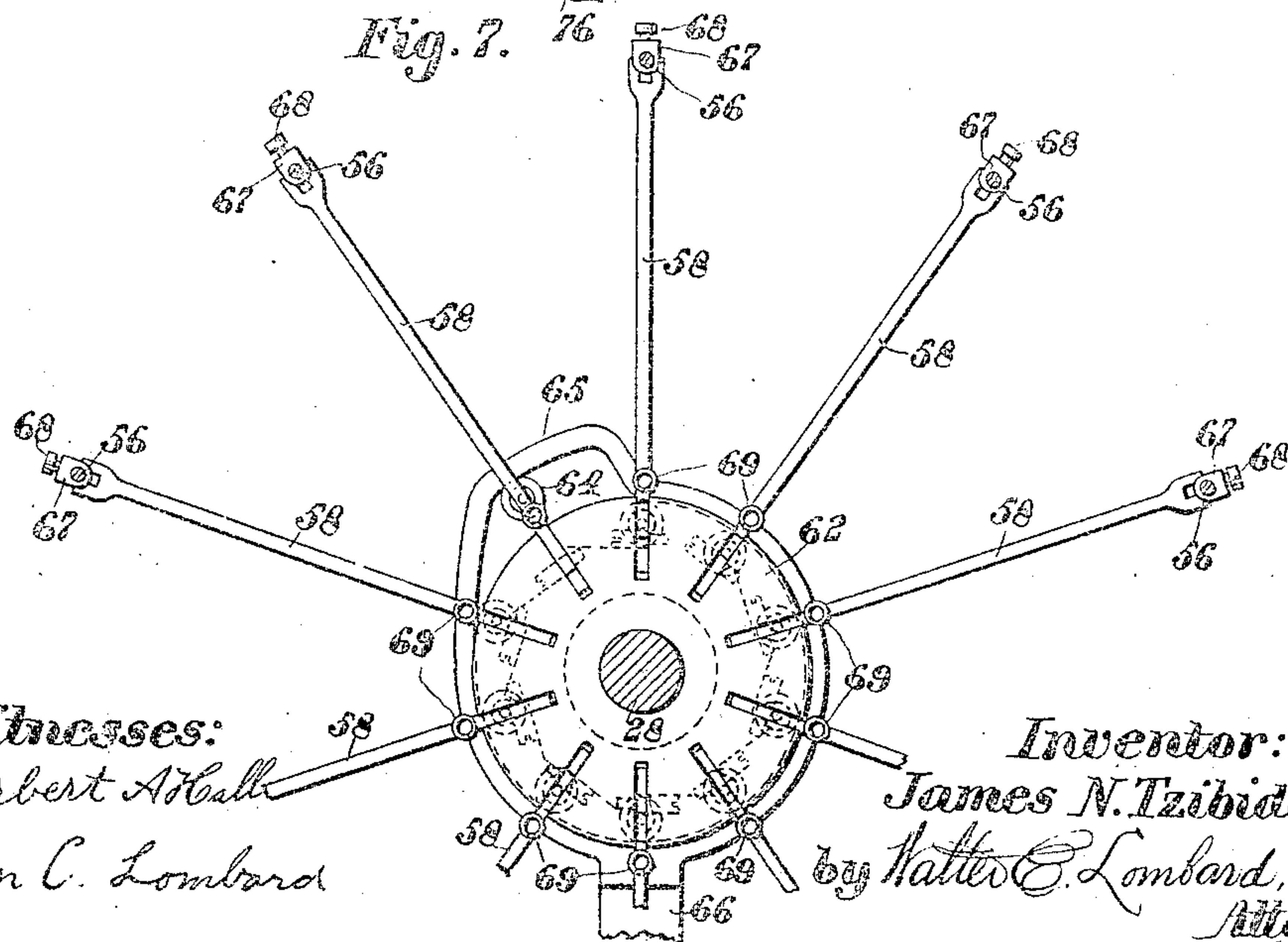
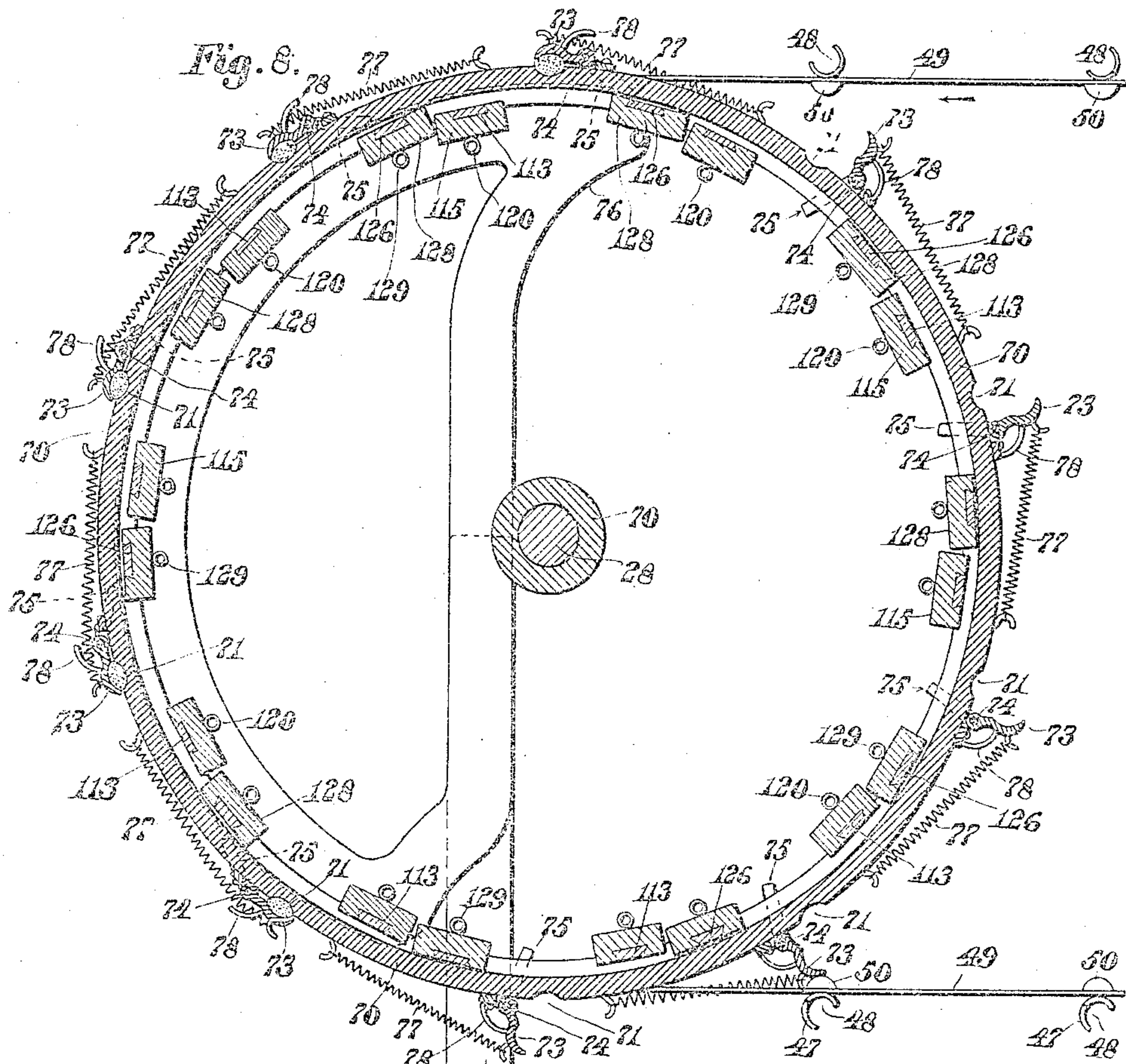
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9 SHEETS—SHEET 7.

Fig. 9.

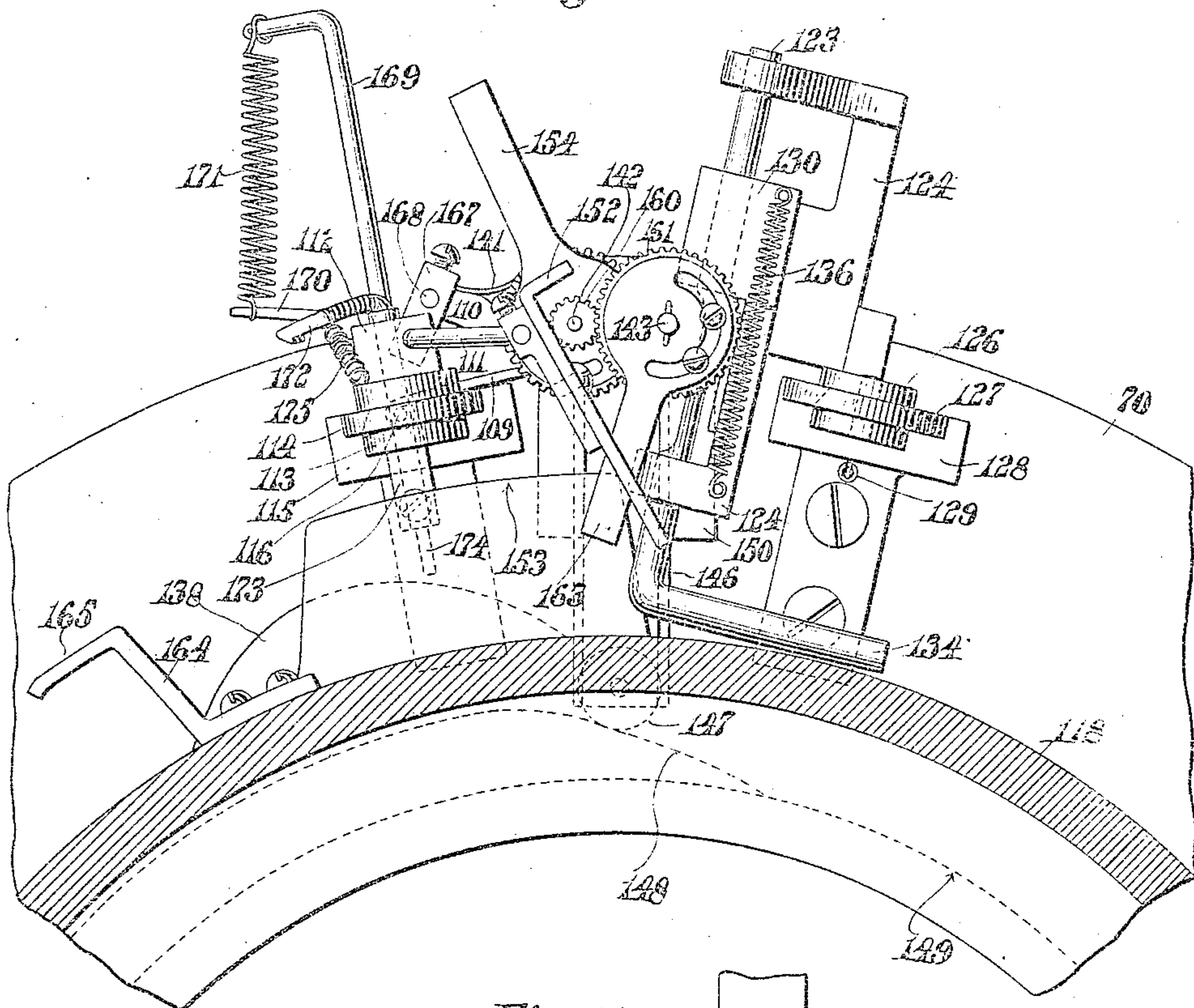
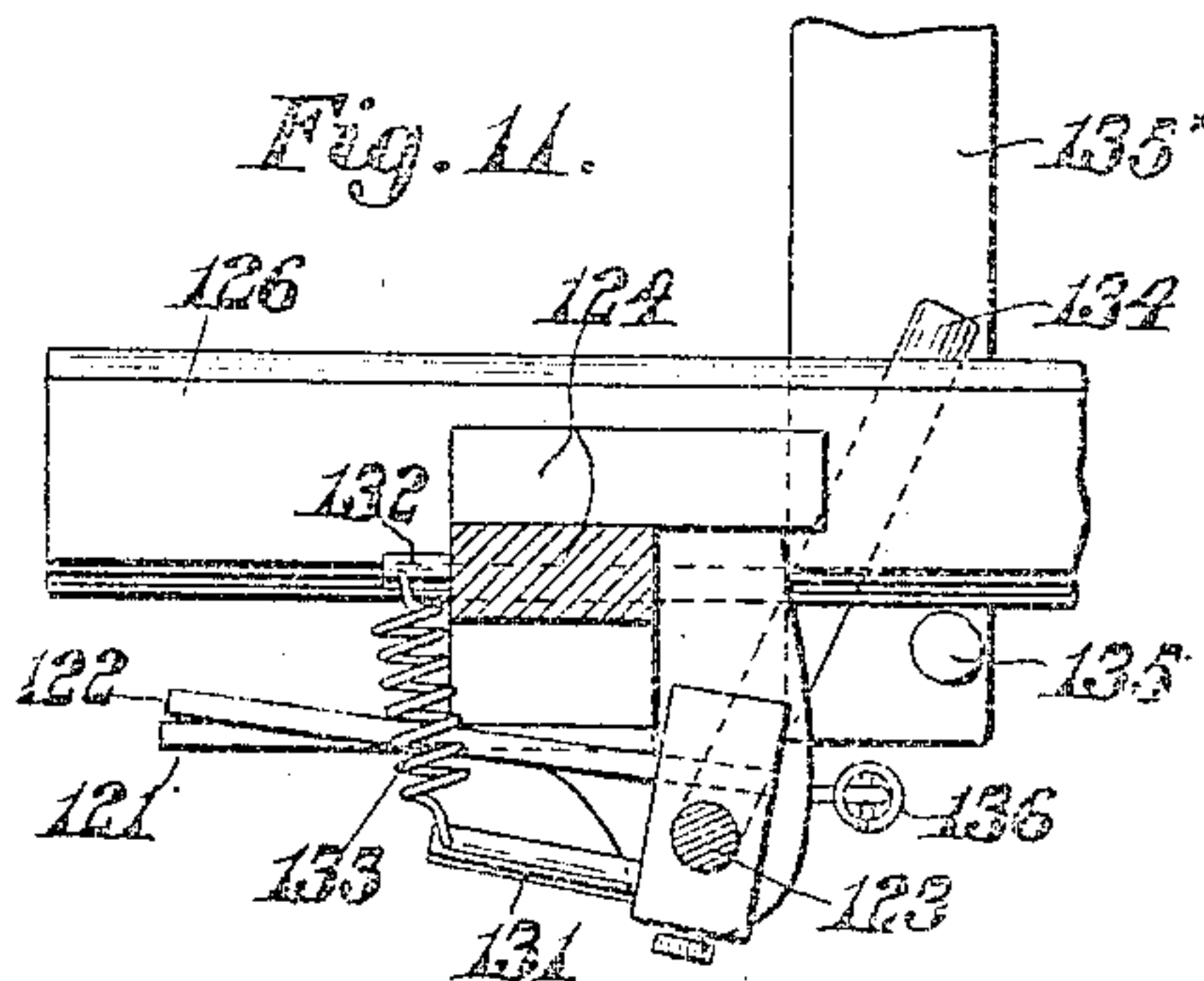


Fig. 11.



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9 SHEETS—SHEET 8.

Fig. 10.

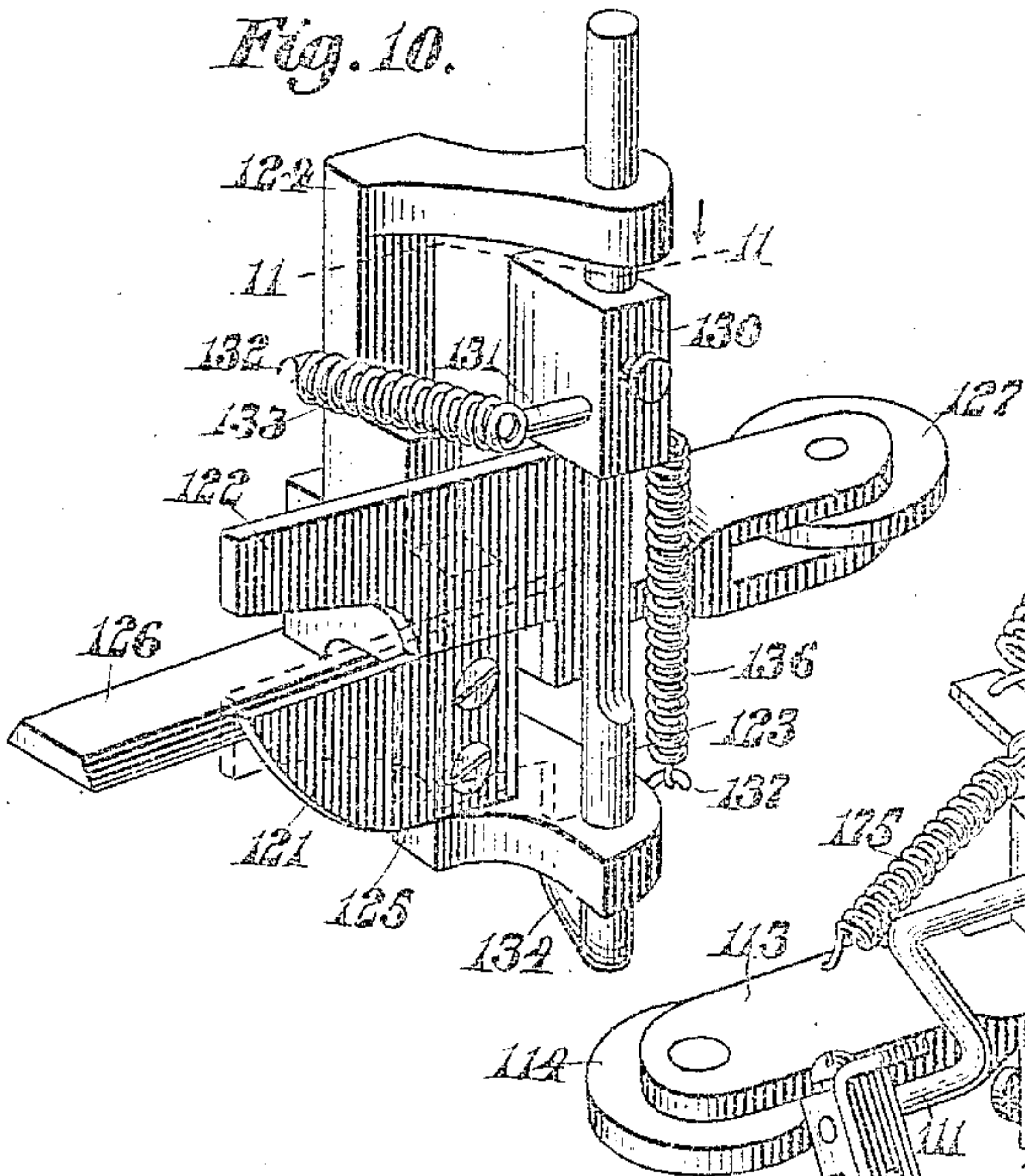


Fig. 13.

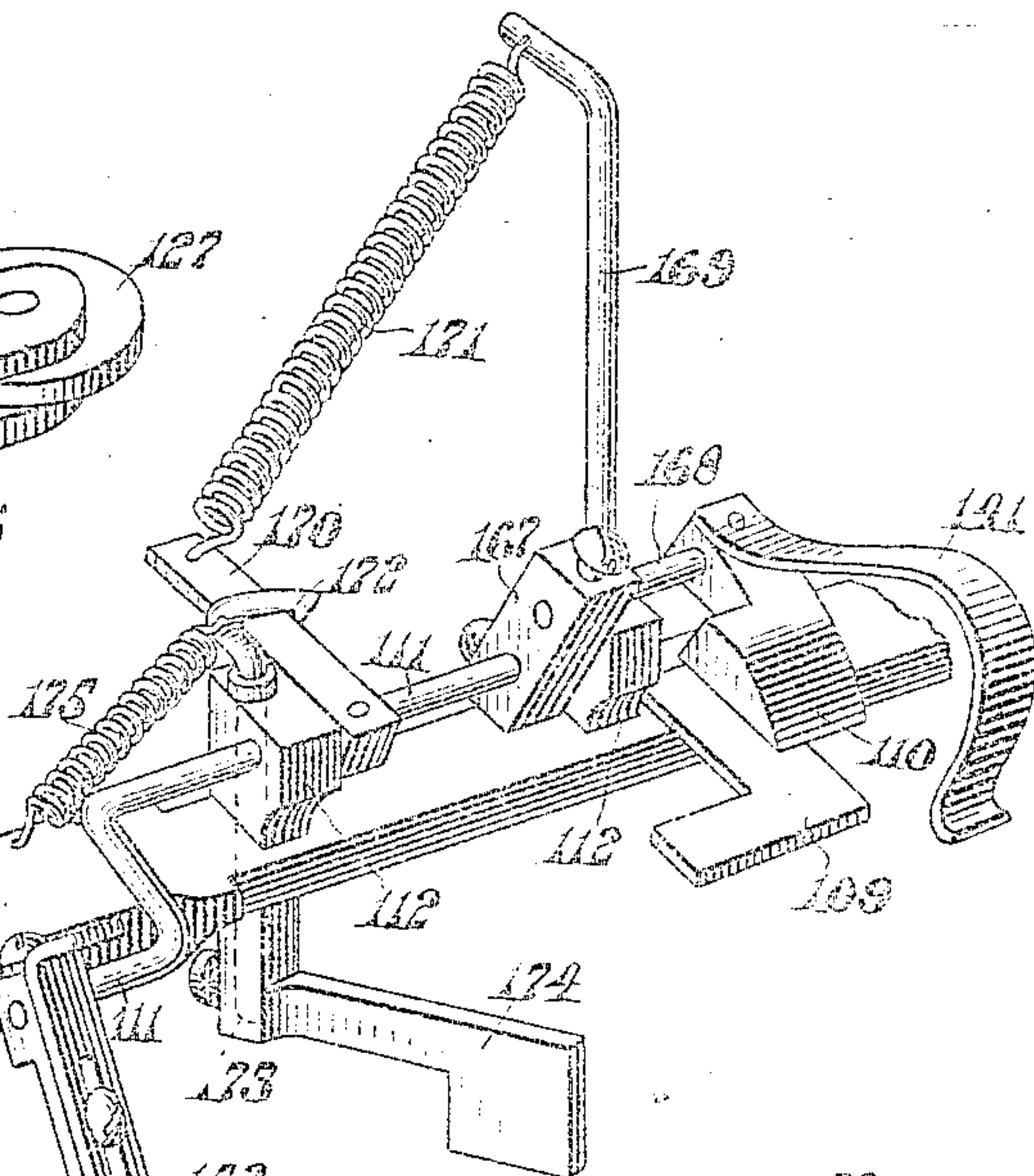


Fig. 12.

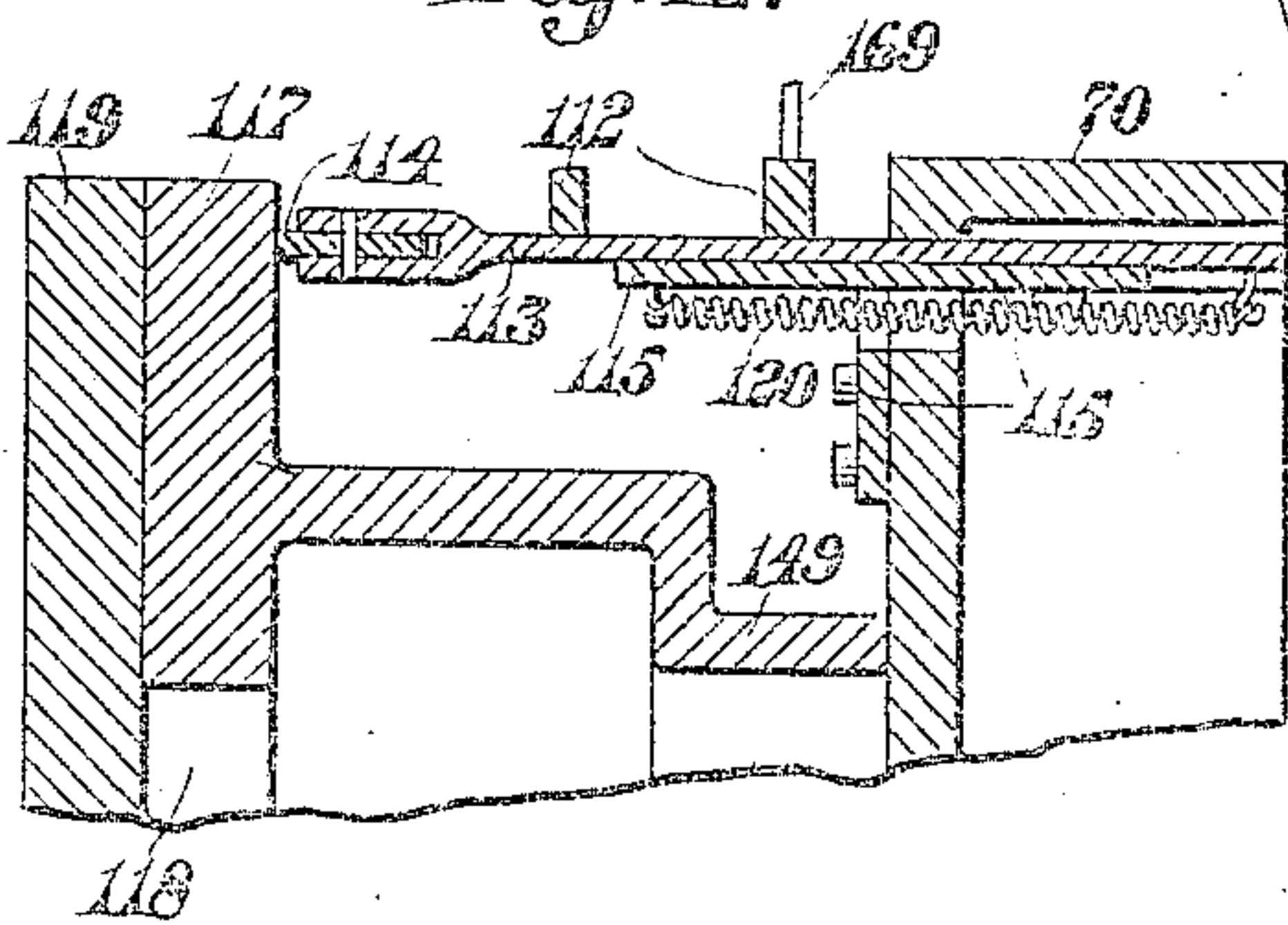


Fig. 14.

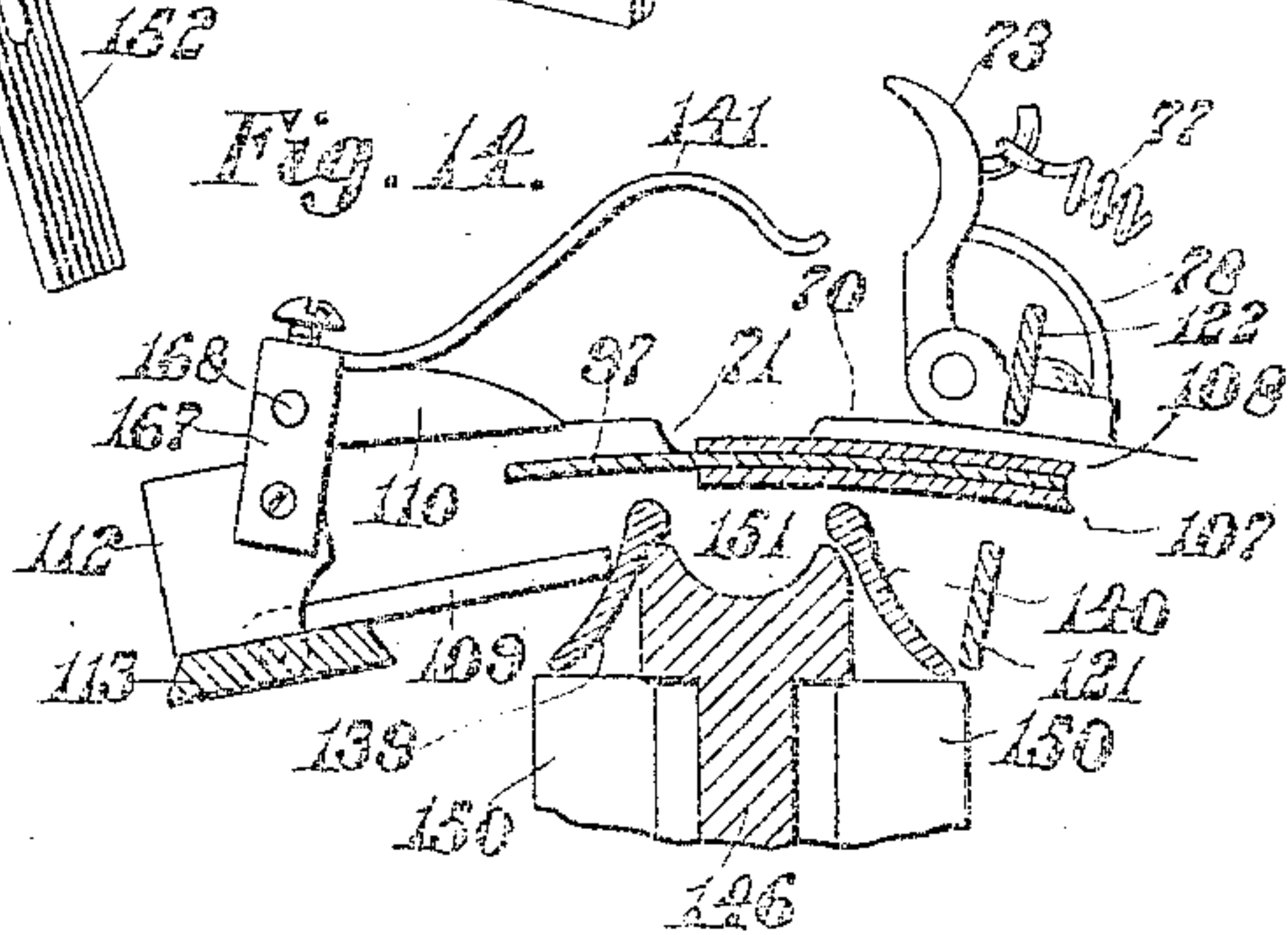


Fig. 15.

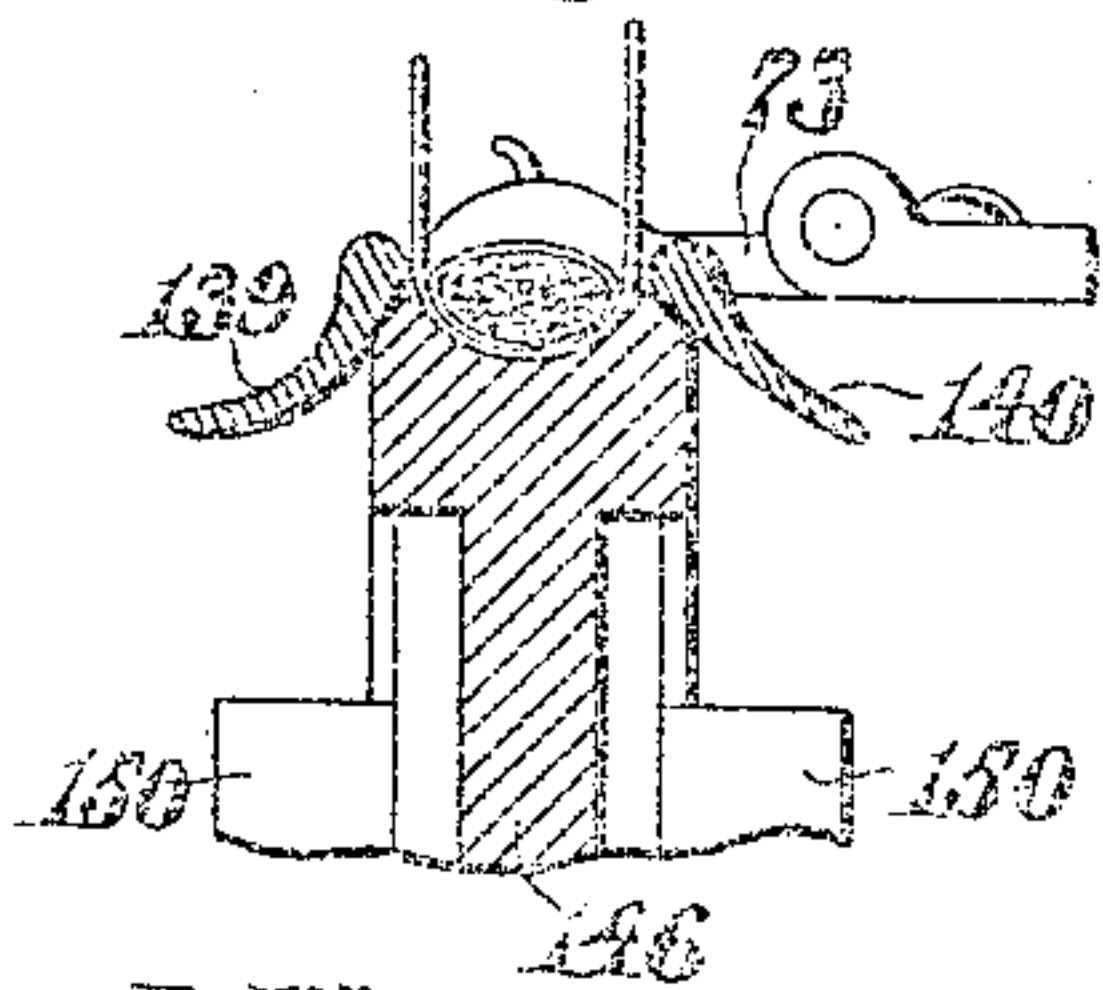


Fig. 16.

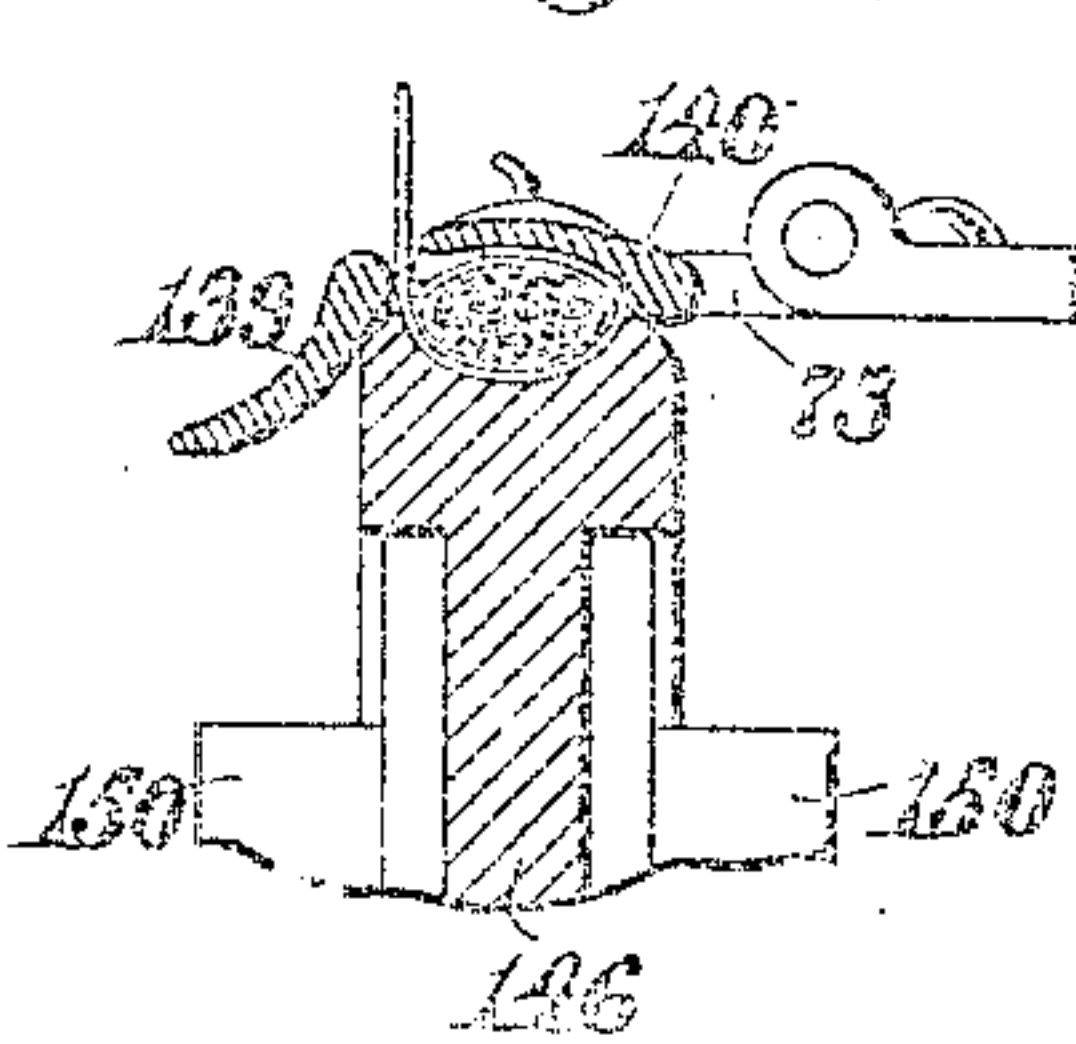
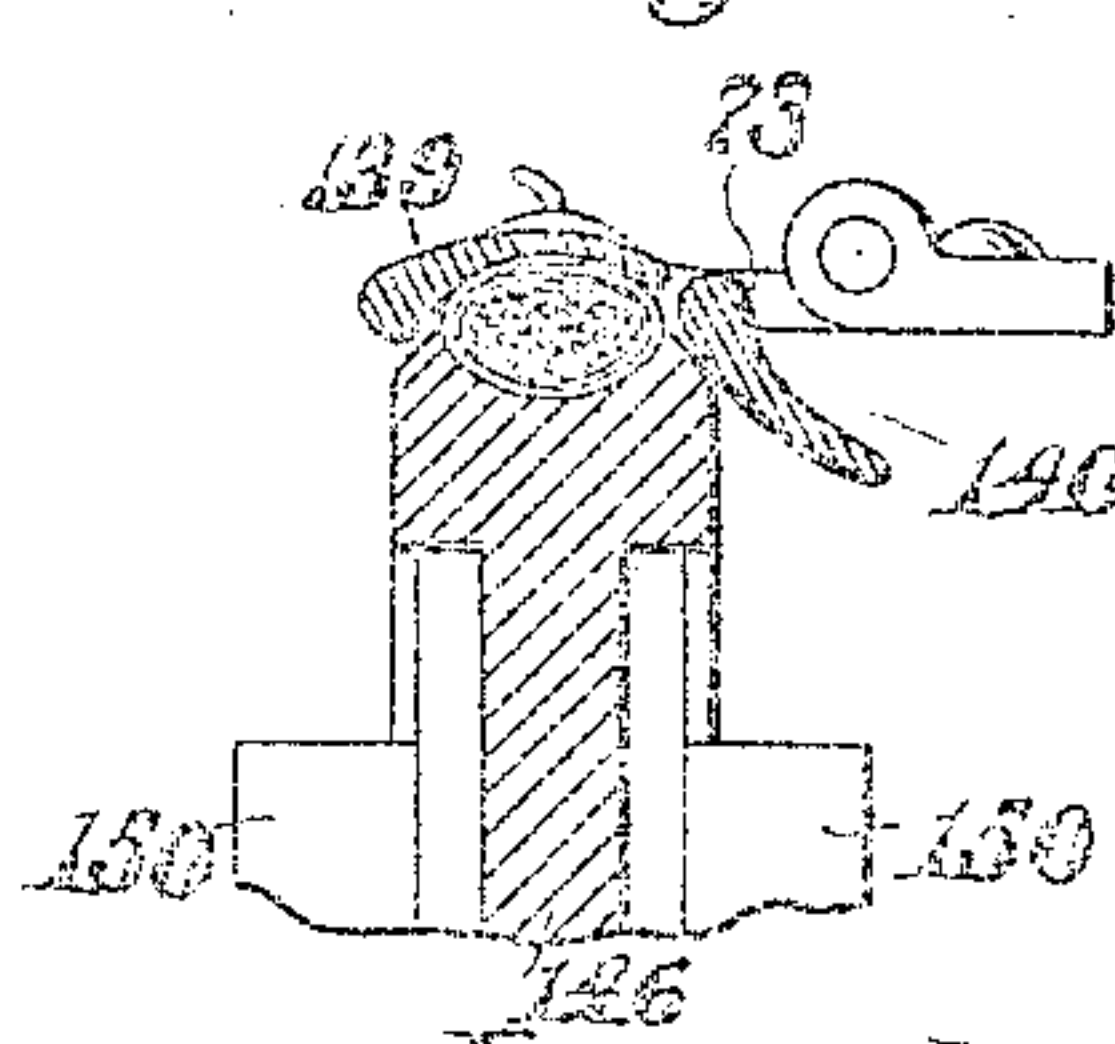


Fig. 17.



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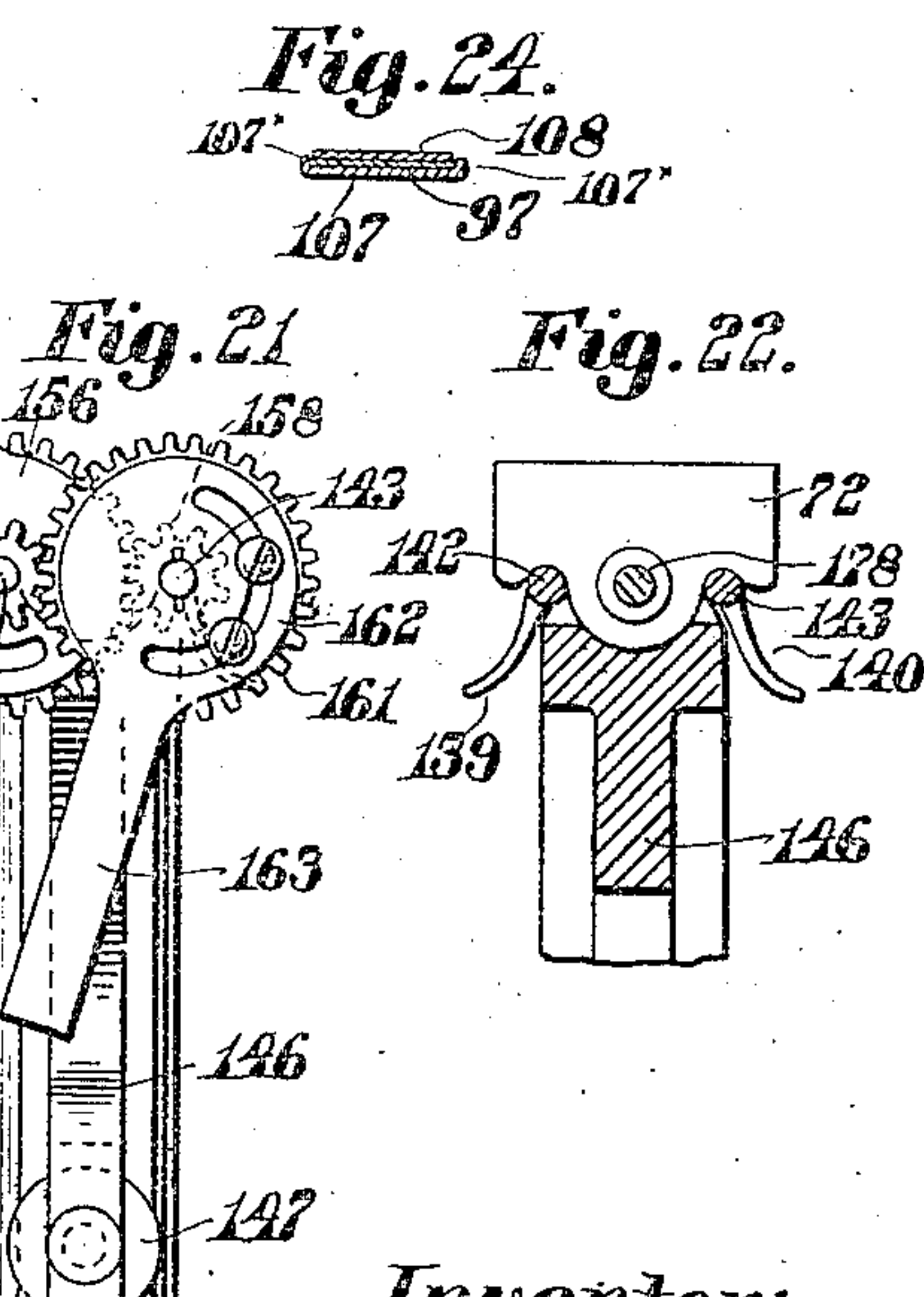
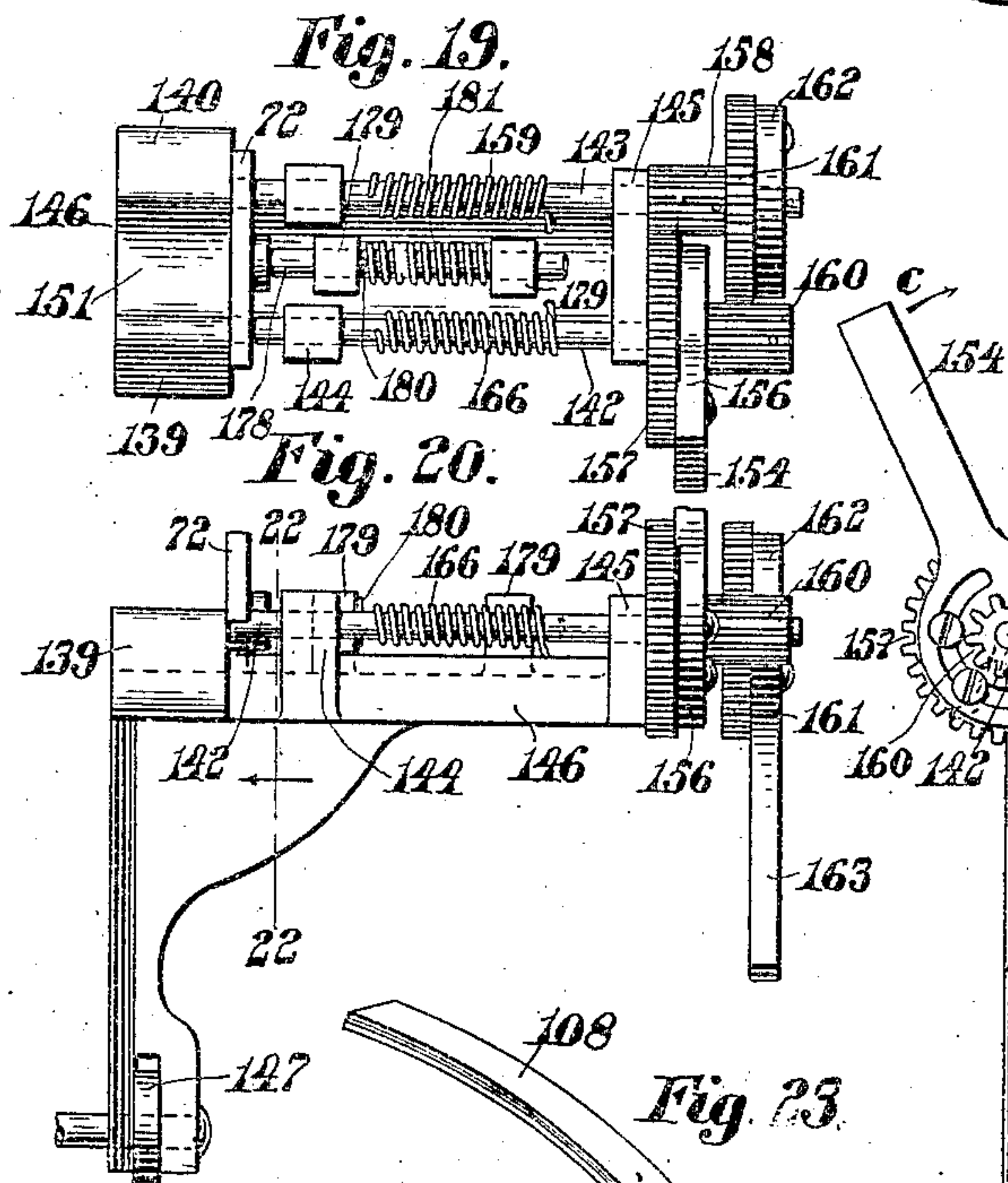
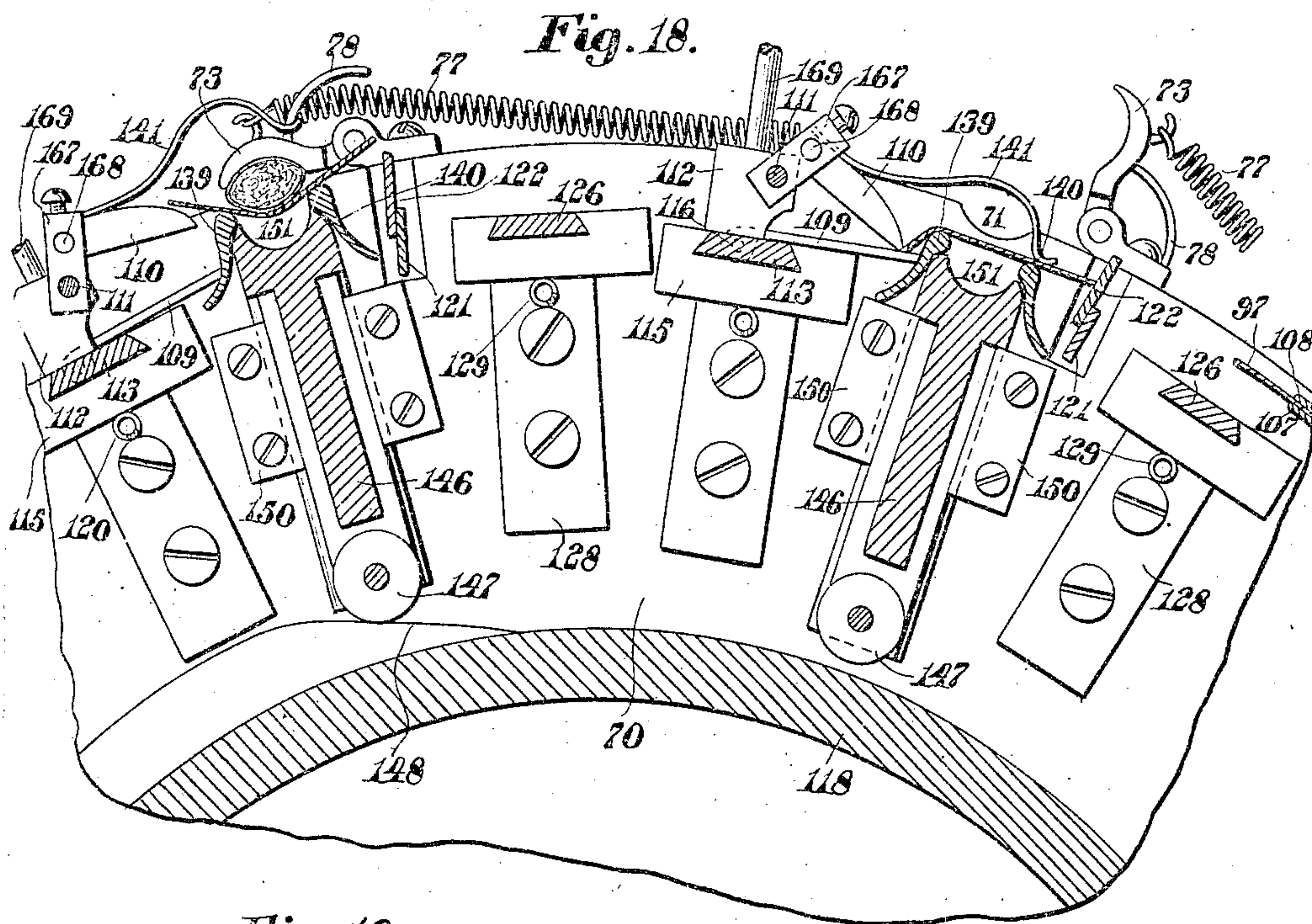
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UNITED STATES PATENT OFFICE.

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MACHINE FOR APPLYING CORK TIPS TO CIGARETTES.

No. 890,734.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed March 25, 1907. Serial No. 304,500.

To all whom it may concern:

Be it known that I, JAMES N. TZIBIDES, a subject of King George of Greece, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Applying Cork Tips to Cigarettes, of which the following is a specification.

This invention relates to machines for applying cork tips to cigarettes and has for its object the production of such a machine in which blanks to form tips may be cut from a continuous strip of material, have paste or similar adhesive applied thereto and may be wrapped about cigarettes suitably positioned upon a revoluble drum and held in such position by suitable gripping devices.

It has for a further object the production of such a machine in which a suitable conveyor belt coöperates with said revoluble drum and delivers cigarettes intermittently to the cigarette-gripping devices mounted upon said revoluble drum.

The invention has for a further object the production of an automatic means of feeding cigarettes intermittently to a conveyor belt provided with suitable cigarette holders each adapted to receive a cigarette and convey it to the cigarette-gripping devices.

The invention consists in certain novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims hereinafter given.

Of the drawings: Figure 1 represents a plan of a machine embodying the features of this invention. Fig. 2 represents a left side elevation of the same. Fig. 3 represents a longitudinal section of the rear end of the same, the cutting plane being on line 3—3 on Fig. 1, looking in the direction of the arrow on said figure. Fig. 4 represents a transverse section on line 4—4, Fig. 3, (looking in the direction of the arrow,) cutting through the revoluble drum carrying the cigarette-holding devices and mechanisms for applying a tip to said cigarette. Fig. 5 represents a transverse section on line 5—5 on Fig. 1, looking in the direction of the arrow thereon. Fig. 6 represents a perspective view of the devices for separating the cigarettes and feeding them to the belt conveyor. Fig. 7 represents a transverse section on line 7—7 on Fig. 4, looking in the direction of the arrow, showing devices for delivering the cigarettes from the conveyor belt to the cigarette-gripping devices.

Fig. 8 represents a transverse section on line 8—8 on Fig. 4, looking in the direction of the arrow and showing the revoluble drum and the devices secured to the periphery thereof for gripping and holding the cigarettes during the operation of applying the tips thereto. Fig. 9 represents an enlarged section similar to Fig. 3 but showing a single complete organization of the cigarette-gripping devices and the tip-cutting, holding, and wrapping devices. Fig. 10 represents a perspective view of the cutting devices for cutting from a continuous strip a blank to form the tip for the cigarette. Fig. 11 represents a horizontal section on line 11—11 on Fig. 10 looking in the direction of the arrow. Fig. 12 represents a vertical section through a portion of the revoluble drum and the tip-holding devices thereon, together with the fixed cam support coöperating therewith. Fig. 13 represents a perspective view of the tip-holding devices. Fig. 14 represents a sectional detail showing the tip-holding devices, the cigarette-gripping devices, and the tip-wrapping devices. Figs. 15, 16, and 17 represents details showing successive positions of the tip-wrapping members and successive operations of the wrapping of the tip on the cigarette. Fig. 18 represents a section of a portion of the fixed cam support and a plurality of the sliding members on the revoluble drum forming part of the devices for gripping the cigarettes, cutting and holding the tip blanks, and wrapping the same about the cigarette. Fig. 19 represents a plan of the mechanism for operating the wrappers adapted to wrap the blanks about the cigarette. Fig. 20 represents a side elevation of the same. Fig. 21 represents an end elevation of the same. Fig. 22 represents a section on line 22—22 on Fig. 20, looking in the direction of the arrow. Fig. 23 represents a perspective view of the guides for the strip of material as it passes to the cutting-off devices, and Fig. 24 represents a section through guides for the cork strip.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 25 represents a suitable platform on which is securely mounted the upright supports 26—27, the latter supports being adjustably secured to said platform by means of the bolts 25* extending through slots 27*, this adjustment providing a means

whereby the supports 27 may be moved toward and from the supports 26, the purpose of which will be hereinafter described. The supports 26 are provided with bearings for a revolvable shaft 28 while the supports 27 are in a similar manner provided with bearings for a revolvable shaft 29, this shaft 29 having secured thereto a drum or wheel 30. Adjacent to the right hand face of the drum or wheel 30 is a table 31 supported in any well-known manner which is adapted to receive a pile of cigarettes to which it is desired to apply tips of cork or other material. The upper face of said table 31 has embedded therein a metal plate 32 provided with a slot 33 extending transversely of the machine parallel with the axis of the revolvable shaft 29. Beneath the slot 33 is mounted an endless belt 34 upon wheels or rollers 35 revolvably mounted in suitable bearings and driven by means of a belt 36 driven by a pulley 37 secured to and revolvable with the shaft 29.

The table 31 is provided with a groove 38 extending to the edge of said table in alignment with the slot 33. The operator manipulates the cigarettes upon the table 31 and moves them into alignment with the slot 38 and permits them to drop therein upon the endless belt 34 which will automatically convey them into the groove 38 in the table 31. When a cigarette has been delivered to the groove 38 it may be held in position therein by means of a gripper 39 pivoted at 40 to the plate 32, said gripper being normally held in open position by means of the spring 41.

The pivoted shaft 40 of the gripper 39 has secured to its outer end a lever or arm 42 the free end of which is provided with a truck 43 which co-acts with a plurality of cams 44 in the face of the revolvable wheel or drum 30 during the revolution of said wheel 30. The cigarettes on the belt 34 are conveyed thereby into the groove 38 and therefrom onto the fixed table 45 which is provided with a stop 45* to limit the outward movement of said cigarettes. This table 45 is provided with a plurality of slots 46 through each of which extends a finger 47 projecting upwardly from a cigarette pocket 48 riveted to or otherwise secured to a flexible metallic belt 49. Each pocket 48 and pair of fingers attached thereto forms a set of holders each set of which is adapted to receive a cigarette and carry it to a point of delivery therefrom. The under face of said belt 49 is provided with the semi-cylindrical transverse members 50 fitting into the semi-cylindrical depressions 51 on the revolvable drum 30, thereby causing the drum 30 to be revolved by the movement of the endless belt 49.

The cam 44 in the revolution of the drum 30 in the direction indicated by the arrow "a" on Fig. 6 causes the gripper 39 to be moved downwardly to grip a cigarette con-

tained within the groove 38 and prevent its further outward movement when a cigarette has been fed up onto the table 45 against the stop 45*. This gripping prevents such injury to the cigarette supported upon said table 45 as would be liable to occur if no provision was made to prevent the automatic feeding of the cigarettes after one of them had come against the stop 45* upon said table. The cigarette upon the table remains in position thereon until the fingers 47, moving along the slots 46, contact therewith, and seize the cigarette and move it off of the table 45 into the pockets 48 by which it is carried to a revolvable drum or wheel 52, provided with semi-cylindrical depressions 53 which engage the transverse members 50 and cause a movement of the endless belt 49 whenever the shaft 28 is revolved by means of any suitable pulley or other driving mechanism (not shown) secured thereto.

Secured to the outer face of the revolvable drum or wheel 52 are a plurality of brackets 54 each provided with a bearing 55 for a push rod 56, the outer end of which is connected by a link 57 to the outer end of an arm or lever 58 pivotally mounted at 59 in slots in a collar 60 secured to and revolvable with the shaft 28. The lever 58 has a radial extension 61 coöperating with the slotted flange 62 to guide the arm or lever 58 in its movement about its pivot 59 and diametrically opposite the extension 61 is another extension 63 carrying a truck or roller 64 which coöperates with a fixed cam 65 secured to or forming a part of a bracket 66 mounted upon a support 26.

The push rod 56 is provided with a collar 67 adjustable thereon by means of the set screw 68, said collar serving as a stop to regulate the inner movement of said push rod 58 when the cam 65 permits a movement of the arm or lever 58 about the pivot 59 by means of the tension of the spring 69, the opposite end of which is secured to the revolvable drum 52. Secured to and revolvable with the shaft 28 is another revolvable drum 70 the periphery of which is provided with a plurality of depressions 71 in the same radial plane as the depressions 53 in the revolvable drum 52. The depressions 71 are in axial line with the cigarette pockets 48 on the conveyer belt 49 and when a cigarette in a pocket 48 is pushed by the push rod 56 from said pocket it will be delivered to the depression 71, the movement of said cigarette being limited by the stop plate 72. As soon as a cigarette is delivered to said depression 71 a gripping jaw 73 pivoted to the periphery of the revolvable drum 70 at 74 is adapted to be moved about its pivot by means of the arm 75 contacting with the fixed cam 76 secured to the bed 25 and interposed between the drums 52 and 70 to cause said jaws 73 to grip the cigarette and retain it within the depression 71 with an

and thereof extending beyond the face of said revoluble drum 70. This provides a ready means of holding the cigarette during the operation of wrapping a cork tip thereon, at the same time protecting the main portion of the cigarette from injury during the operation of applying the tip, only a sufficient length of the end of the cigarette being exposed to provide a ready means of applying a tip thereto.

The closing of the jaw 73 is secured by the action of the arm 75 upon the fixed cam 76 as has been described and as soon as this arm 75 leaves the cam 76 the jaw is again returned to its normal position by means of the spring 77, the opening of the jaw 73 being limited by means of the arm 78 in an obvious manner. The shaft 28 has secured thereto a bevel gear 79 which meshes with a bevel pinion 80 secured to a shaft 81 revoluble in bearings 82 and 83 supported in any suitable manner on one of the supports 26 and a frame 84 intermediate the shafts 28 and 29.

The frame 84 is provided with a paste receptacle 85 adjustably secured thereto by the clamp nuts 85* on the threaded shanks 84* projecting from the frame 84, in which is mounted a drum 86 revoluble upon a shaft 87 supported in slots 88 formed in the inner wall of the paste receptacle 85. The shaft 87 has secured thereon a gear 89 meshing with a gear 90 secured to a shaft 91 revoluble in the frame 84 and having secured thereon a drum 92 contacting with the paste wheel or drum 86. The shaft 91 has secured thereto a bevel gear 91* meshing with a bevel pinion 81* on the shaft 81 by which it is driven. On either side of the paste wheel 86 is a doctor plate 93 adapted to scrape off the paste from the sides of said wheel as it revolves in the direction of the arrow "b" on Fig. 3, in the paste contained within the receptacle 85. In like manner a doctor plate 94 coöperates with the periphery of said paste wheel, this doctor plate being pivoted at 95 and adjustable about said pivot by means of the adjusting device 96. By adjusting this device 96 any thickness of paste may be left upon the periphery of the wheel 86 to be transferred to the wheel 90 from which it is transferred to the strip of cork or other similar material 97 mounted in a coil 98 upon a shaft 99 revoluble in the supports 100 extending upward from the platform 25. The strip of cork 97 passes over a revoluble wheel 101 mounted in any suitable manner on the paste receptacle 85 and then passes upwardly between the drum 92 and a pressure wheel 102 revolvably mounted in the end of an arm 103 pivoted at 104 to an extension 105 from said frame 84. This pressure roll 102 holds the strip of cork against the periphery of the paste wheel 92 by means of the spring 106. The strip of material 97 passes through an opening 97* in a plate 107 secured to the

upper part of the frame 84, this plate having secured thereto an upper plate 108 which coöperates with the plate 107 to guide the strip of material to the cutting-off devices, the plate 107 having for a portion of its length upturned sides 107* (see Figs. 23 and 24). When the strip of material 97 is cut off by the cutting-off devices it always leaves a portion thereof extending beyond the ends of the plates 107—108 in a position to be gripped between the plate 109 and jaw 110, the latter of which is mounted upon an oscillating shaft 111 which is mounted in suitable bearings in the bosses 112 formed upon or secured to the slide 113 having secured at one end a roller 114 by which the slide 113 is movable longitudinally of a supporting bracket 115 secured to the outer face of the revoluble drum or wheel 70.

The plate 109 is pivotally mounted at 116 upon said slide 113 and moves longitudinally of said bracket 115 in unison with the jaw 110 when the roller 114 is operated upon by the cam surface 117 formed upon a flange of the fixed cam support 118 secured to the plate 119 projecting upwardly from the platform 25. The cam 117 moves the slide 113 in one direction while the spring 120 moves it in the opposite direction.

When the end of the strip 97 is gripped between the plate 109 and jaw 110 and the wheel or drum 70 continues to revolve, a portion of the strip is pulled from between the plates 107—108 and between the fixed shear plate 121 and the movable shear plate 122, the latter plate being secured to an oscillating radial pin or shaft 123 mounted in ears of a frame 124 to which the fixed plate is secured by suitable screws 125. The frame 124 is secured to a slidable member 126 provided at one end with a roller 127 which coöperates with the cam face 117 to move the slide 126 longitudinally of a supporting bracket 128 secured to the outer face of the revoluble drum 70. The roller 127 acting against the cam 117 moves the slide 126 in one direction while a spring 129 moves it in the opposite direction in an obvious manner.

The oscillating shaft 123 has secured thereto a collar 130 having a projecting pin 131 between which and a pin 132 fixed to the frame 124 is a spring 133 which is adapted to move the shaft 123 about its axis when in elevated position to cause the under edge of the movable plate 122 to rest upon the upper edge of the fixed plate 121 to normally retain it there. This plate 122 is thus retained in its elevated position upon the fixed plate 121 until the arm 134 strikes the radial pin 135 on the cam portion 135* of the fixed cam support 118 which moves the oscillating shaft 123 about its axis to disengage the edges of the knives 122 and 121, thus allowing the spring 136 interposed between the block 130 and a hook 137 in the frame 124 to move the

shaft 123 downwardly to cause a cutting off of the strip of material 97 between the knife blades 121—122. It is obvious that the tension of the spring 133 will keep these blades in contact during their movement relative to one another so that a perfect shearing cut is secured. The plate 122 remains in this downward position until the shaft 123 moves over the cam projection 138 which lifts the shaft 123 against the tension of the spring 136 until the plate 122 is above the plate 121 when the spring 133 will act to again lock these plates in their normal position. When this cutting off of the piece of material occurs the cork strip 97 from which the tip is to be formed will lie across a pair of wiping members 139—140 and a spring member 141 secured to the gripping jaw 110 will cooperate with the wiper 140 to hold the portion of material firmly and prevent it from curling, all as indicated at the right of Fig. 18 of the drawings. The wiping members 139—140 are each provided with a pivotal shank 142—143 mounted in suitable bearings 144 and 145 in a slidable member 146 provided at its lower end with a revoluble truck or roller 147 adapted to cooperate in the revolution of the drum 70 with the cam 148 projecting outwardly from a hub 149 on the fixed cam support 118 to move the slide 146 in one direction while the spring 146* moves it in the opposite direction.

The slide 146 is mounted between suitable guides 150 secured to the outer face of the revoluble drum or wheel 70 and is provided at its outer end with a suitable depression 151 adapted to form a support for the end of the cigarette when the slide 146 has been moved outwardly by the cam 148 into the position indicated in Fig. 18, the main portion of the cigarette being at the same time held rigidly in position in the depression 71 by the gripping jaw 73. At about the same time that the slides 146 move outwardly by the roller 147 rising on the cam 148 the arm 152 will come in contact with and ride over the cam projection 153 and cause the jaw 110 and its spring clamp 141 to be lifted and release its pressure upon the tip blank thus permitting the outward movement of the slide 146 to move this blank into a U shape partly wrapped around a cigarette as is shown in Fig. 15. As the drum or wheel 70 continues to revolve an arm 154 loosely mounted upon the pivoted shaft 142 of the wiper 139 will come into contact with a fixed stop 155 and cause said arm to move about the axis of said shaft. Adjustably secured to the disk portion 156 of said arm, by means of suitable screws passing through a slot therein, is secured a gear 157 meshing with a pinion 158 rigidly secured to the pivoted shaft 143 of the wiper 140. It is obvious therefore that any movement of the arm 154

in the direction of the arrow "c" on Fig. 21 will cause a reverse movement of the pinion 158 and the wiper 140 to move one end of the tip blank into the position shown in Fig. 16, the wiper 140 remaining in this position only while the arm 154 is in contact with the fixed stop 155. As soon as the arm passes this fixed stop the torsional spring 159 will return the wiper 140 to its normal position as shown at the right of Figs. 15 and 17. The pivoted shaft 142 has secured thereto a pinion 160 meshing with a gear 161 similarly secured to a disk plate 162 loosely mounted on shaft 143 provided with a radial arm 163 which in the revolution of the drum 70 comes into contact with a fixed stop 164 and moves the wiper 139 into the position shown in Fig. 17 thereby carrying the other end of the tip blank into position to wrap it about the cigarette, in which position it is retained for a short time to permit the adhesive to set, while the arm 163 passes over the cam portion 165. As soon as the arm has left this cam portion 165 the torsional spring 166 will cause the wiper 139 to return to its normal position as indicated at the left of Figs. 15 and 16.

The mechanism for locking the tip-blank clamping members 109—110 and releasing them is of a peculiar construction and is mounted upon the slide 113. The shaft 111 has secured thereto the block 167 which has secured to one end thereof a pin 168 to which the jaw 110 is secured. One of the blocks 112 has secured therein a support 169 between the outer end of which and the outer end of an arm 170 secured to said shaft 111, is interposed a spring 171 which normally tends to move the shaft 111 about its axis to keep the jaw 110 in contact with the plate 109. This closing movement of the jaw 110 is normally prevented by means of the hooked latch 172, the shank 173 of which extends through a block 112 and the slide 113 and has secured to its opposite end an arm 174.

Between the hooked latch 172 and the slide 113 is interposed a spring 175 which is adapted to move the latch 172 about the axis of its shank 173 out of the path of movement of the arm 170 to permit the closing of the jaw 110. In the revolution of the drum 70 the arm 152 will contact with the cam projection 176 and move the shaft 111 sufficiently about its axis to disengage the arm 170 from the hooked end of the latch 172 permitting the spring 175 to act upon the latch to move it out of the path of the arm 170, thus permitting the spring 171 to act upon said arm to close the jaw 110 as the arm 152 rides down the rear curved face of the cam projection 176. The jaw 110 will remain closed until the arm 152 contacts with the cam projection 153 which will again move the arm 170 downward to open the jaw 110

and while the arm 170 is below its normal position the arm 174 will contact with a projecting pin 177 to return the hooked latch 172 to its normal position against the tension of the spring 175 and when in this position the arm 152 will leave the cam projection 153 and permit the spring 171 to move the arm 170 about the axis of the shaft 111 to again lock this arm in open position.

10 The stop plate 72 is provided with a shank 178 extending through bearings 179 projecting from the upper face of the slide 146, the shank 178 being provided with a pin or shoulder 180 between which and the rear bearing 15 179 is interposed a spring 181 which normally retains said guide plate 72 against the edges of the wipers 139—140. This yieldability of the stop plate 72 is to provide for the passage of said plate by the guide 107 for 20 the strip of the tip material, the edges of which guides are upturned as indicated at 107*, in Fig. 24, making the guide of greater width than the material itself. By this means the plate will be moved against the 25 tension of the spring 181 as it passes by the guide 107 but will then assume its normal position against the edges of the wipers 139—140 to register the blank as soon as it has passed the mouth of said guide 107.

30 The supports 27—27 are additionally held from movement longitudinally of the platform 25 by the threaded adjustable stops 180* mounted in ears 181* projecting upwardly from the platform 25 as shown in 35 Figs. 1 and 2 of the drawings.

The revoluble drum 70 is provided with a plurality of organizations, each organization including a cigarette-gripping mechanism, a blank cutting-off mechanism, and devices for 40 holding the blanks and devices for wrapping the blank, thus severed, around the end of a cigarette, and the devices in each organization are successively operated as they revolve about a fixed cam support. It is ob- 45 vious, that, while in the present embodiment ten such organizations are shown mounted upon the periphery of the revoluble drum, a greater or lesser number of such organizations may be used without affecting the prin- 50 ciples of this invention.

It is obvious that from the foregoing description and an inspection of the drawings that the work of the operator consists en- 55 tirely in feeding the cigarettes to the slot 33 above the movable belt 34 and that the remainder of the work of the machine will be done automatically without the necessity of handling, the cigarettes being fed intermit- 60 tently to the belt conveyer and from this pushed successively to suitable jaws by which each cigarette is gripped, while at the same time a strip of cork is being fed between suitable rollers, one of which is applying 65 paste to a surface thereof and from which portions are being cut to form blanks which

are afterwards automatically wrapped around the end of the cigarette, the cigarettes thus tipped being delivered at the opposite end of the machine to any suitable conveyer or 70 receptacle.

It is believed from the description herein given that the operation and many advantages of the machine of this construction will be thoroughly understood.

Having thus described my invention, I 75 claim:

1. The combination with a table; of two revoluble drums one of which has secured thereto and revolving therewith devices for wrapping tips upon cigarettes while the other 80 is mounted adjacent to said table; a movable endless belt provided with cigarette retainers extending from one drum to the other; and means for feeding the cigarettes from the table to said cigarette retainers. 85

2. The combination with a table; of two revoluble drums one of which has secured thereto and revolving therewith devices for wrapping tips upon cigarettes while the other 90 is mounted adjacent to said table; a movable endless belt upon said drums; a plurality of pockets secured thereto each adapted to retain a cigarette therein; and means for feeding the cigarettes from the table to said 95 pockets.

3. The combination with a table; of two revoluble drums one of which has secured thereto and revolving therewith devices for wrapping tips upon cigarettes while the other 100 is mounted adjacent to said table; a movable endless metallic belt upon said drums; a plurality of pockets secured thereto each adapted to retain a cigarette therein; and means for feeding the cigarettes from the table to 105 said pockets.

4. The combination with a table; of two revoluble drums one of which has secured thereto and revolving therewith devices for wrapping tips upon cigarettes and both of 110 which have transverse grooves therein; a movable endless belt on said drums provided with cigarette retainers and transverse members secured to the under face thereof adapted to engage said grooves in said drums; means for revolving one of said drums; and 115 means for feeding cigarettes to said retainers from said table.

5. The combination with a table; of two revoluble drums one of which has secured thereto and revolving therewith devices for 120 wrapping tips upon cigarettes and each of which has transverse peripheral grooves therein; a movable endless belt on said drums provided with cigarette retainers and transverse members secured to the under face 125 thereof adapted to fit said peripheral grooves in said drums; means for revolving said drums; and means for feeding cigarettes from said table to said retainers.

6. The combination with a table; of two 130

revoluble drums one of which has secured thereto and revolving therewith devices for wrapping tips upon cigarettes and the other of which is mounted adjacent to said table; a
5 movable endless belt on said drums provided with a plurality of cigarette-retaining pockets on one face and a plurality of transverse members on the opposite face adapted to co-operate with said drums; means for revolving
10 said drums; and means for automatically feeding the cigarettes from said table to said pockets.

7. The combination with a table; of two
15 revoluble drums one of which has secured thereto and revolving therewith devices for wrapping tips upon cigarettes and each of which is provided with a plurality of transverse peripheral grooves; a movable endless belt provided with a plurality of cigarette-retaining
20 pockets on one face and a plurality of transverse members on the opposite face adapted to coöperate with said grooves in said drums, said members and pockets being directly opposite one another; means for
25 moving said belt; and means for feeding cigarettes from said table to said pockets.

8. The combination with a revoluble drum provided with devices for wrapping tips upon
30 cigarettes; of a movable endless belt provided with cigarette holders and devices for registering said belt upon said drum; and means revoluble with said tip-wrapping devices for forcing the cigarettes from said
holders to the tip-wrapping devices.

35 9. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt provided with cigarette holders and devices for registering said belt upon said drum; and
40 means revoluble with said tip-wrapping devices for successively forcing the cigarettes from said holders to the tip-wrapping devices.

10. The combination with a revoluble
45 drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt provided with cigarette holders and devices for registering said belt upon said drum; and cam-operated means revoluble
50 with said drum for forcing the cigarettes from said holders to the tip-wrapping devices.

11. The combination with a revoluble drum provided with devices for wrapping
55 tips upon cigarettes; of a movable endless belt provided with cigarette holders and devices for registering said belt upon said drum; a cam; pivoted levers revoluble with said drums and operated by said cam; and
60 reciprocating members pivoted to the free ends of said levers adapted to push the cigarettes from said pockets to the tip-wrapping devices.

12. The combination with a revoluble drum provided with devices for wrapping
65 tips upon cigarettes; of a movable endless

belt provided with cigarette holders and devices for registering said belt upon said drum; a revoluble shaft to which said drum is secured; a collar secured to said shaft; a plurality of levers pivoted to said collar; a fixed
70 cam adapted to move said levers about their pivots; and a rod pivoted to the free end of each of said levers adapted to push the cigarettes from said holders to said tip-wrapping devices.

13. The combination with a revoluble drum provided with devices for wrapping
75 tips upon cigarettes; of a movable endless belt provided with cigarette holders and devices for registering said belt with said drum; a revoluble shaft to which said drum is secured; a collar secured to said shaft; a plurality of levers pivoted to said collar; a fixed
80 cam adapted to move said levers about their pivots; a rod pivoted to the free end of each of said levers adapted to push the cigarettes from said holders to said tip-wrapping devices; and a guide for each rod.

14. The combination with a revoluble drum provided with devices for wrapping
85 tips upon cigarettes; of a movable endless belt provided with cigarette holders and devices for registering said belt upon said drum; a revoluble shaft to which said drum is secured; a collar secured to said shaft; a
90 plurality of levers pivoted to said collar, each provided with a roller; a fixed cam adapted to act upon said rollers to move said levers about their pivots; and a rod pivoted to the
95 free end of each of said levers adapted to push the cigarette from said holder to said tip-wrapping devices.

15. The combination with a revoluble drum provided with devices for wrapping
100 tips upon cigarettes; of a movable endless belt provided with cigarette holders and devices for registering said belt upon said drum; a revoluble shaft to which said drum is secured; a collar secured to said shaft; a plurality of levers pivoted to said collar each
105 provided with a roller; a fixed cam adapted to act upon said rollers to move said levers about their pivots; a spring to retain said roller in contact with said cam; and a rod pivoted to the free end of each of said levers
110 adapted to push the cigarette from said holder to said tip-wrapping devices.

16. The combination with a revoluble drum provided with devices for wrapping
115 tips upon cigarettes; of a movable endless belt provided with cigarette holders and devices for registering said belt upon said drum; a revoluble shaft to which said drum is secured; a collar secured to said shaft; a plurality of levers pivoted to said collar each
120 provided with a roller; a fixed cam adapted to act upon said rollers successively to move said levers about their pivots; a spring to retain said roller in contact with said cam; and
125 a rod pivoted to the free end of each of said

levers adapted to push the cigarette from said holder to said tip-wrapping devices.

17. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt provided with cigarette holders and devices for registering said belt upon said drum; a revoluble shaft to which said drum is secured; a collar secured to said shaft; a plurality of levers pivoted to said collar each provided with two radial arms; a fixed cam adapted to act upon one of said arms to move said levers about their pivots; guides for the other arm; and a rod pivoted to the free end of each of said levers adapted to push the cigarette from said holder to said tip-wrapping devices.

18. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt provided with a plurality of sets of cigarette holders; a supply table; and mechanism secured to said table for automatically selecting a single cigarette and feeding it longitudinally into the path of each set of said holders.

19. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt; a plurality of pockets secured thereto each provided with a set of fingers adapted to seize a cigarette and retain it in said pockets; a grooved table at one side of said belt; and means for selecting a single cigarette and feeding it endwise through said groove into the path of each set of said fingers.

20. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt; a plurality of pockets secured thereto each provided with a set of fingers adapted to seize a cigarette and retain it in said pockets; a grooved table at one side of said belt; and a movable member adapted to select a single cigarette and feed it endwise into said groove and through it into the path of each set of said fingers.

21. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt provided with cigarette holders; a grooved table at one side of said belt; and a device for gripping a cigarette in said groove and preventing its delivery therefrom.

22. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt provided with cigarette holders; a grooved table at one side of said belt; a device for gripping a cigarette in said groove to prevent its delivery therefrom; and a revoluble cam for operating said device.

23. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless

belt provided with a plurality of cigarette-retaining pockets; a grooved table at one side of said belt; a device for gripping a cigarette in said groove to prevent its delivery; a cam to move said device in one direction; and a spring to move it in the opposite direction.

24. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt provided with a plurality of cigarette-retaining pockets; a slotted platform above said belt; means for feeding cigarettes to said platform; and fingers forming a part of said pockets extending through said slots and above the upper face of said platform.

25. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a movable endless belt provided with a plurality of cigarette-retaining pockets; a slotted platform above said belt; means for feeding cigarettes to said platform; a stop on said table in the path of movement of said cigarettes; and fingers forming a part of said pockets extending through said slots and above the upper face of said platform.

26. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a second drum; a supply table adjacent thereto; a movable endless belt provided with cigarette holders mounted on said drums; a shaft on which said second drum is mounted; and means for adjusting said second drum and said table toward and from the drum carrying the tip-wrapping devices.

27. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a second drum; a supply table adjacent thereto; a movable endless belt provided with cigarette holders mounted on said drums; a revoluble shaft on which said second drum is mounted; and means for adjusting said second drum and said table to and from the drum carrying the tip-wrapping devices.

28. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a second drum; a movable endless belt provided with a plurality of sets of cigarette holders and devices for registering said belt upon said drums; means at one side of said belt for automatically selecting a single cigarette and feeding it endwise into the path of each set of holders; and means for successively forcing the cigarettes from said holders to the tip-wrapping devices on the first-mentioned drum.

29. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a second drum; a movable endless belt provided with a plurality of sets of cigarette holders and devices for registering said belt upon said drums; automatic means at one side of said belt for se-

lecting a single cigarette and feeding it endwise into the path of each set of holders; and means for forcing the cigarette from said holders to the tip-wrapping devices.

5 30. The combination with a revoluble drum provided with devices for wrapping tips upon cigarettes; of a second drum; a movable endless belt provided with a plurality of sets of cigarette holders and devices
10 for registering said belt upon said drums; automatic means at one side of said belt for selecting a single cigarette and feeding it endwise into the path of each set of holders; and means for forcing the cigarette from said
15 holders to the tip-wrapping devices at a predetermined point in the rotation of said first-mentioned drum.

31. The combination of a series of cigarette-gripping jaws; devices for applying an
20 adhesive to a tip for the cigarette; devices for wrapping said tip about said cigarette; and means for bringing said cigarette-gripping jaws into receiving position with respect to a conveyer adapted to deliver cigarettes
25 thereto.

32. The combination of a series of cigarette-gripping jaws; devices for cutting a tip for said cigarettes; means for applying an adhesive thereto; means for wrapping the tip
30 about said cigarette; and means for successively bringing said cigarette-gripping jaws into receiving position with respect to a conveyer adapted to deliver cigarettes thereto.

33. The combination of a series of cigarette-gripping jaws; devices for cutting a
35 portion of material to form a tip from a continuous strip; means for holding both ends of said portion of the tipping material to prevent it from curling; means for applying
40 an adhesive to said tipping material; means for wrapping the tip about a cigarette; and means for successively bringing said cigarette-gripping jaws into receiving position with respect to a conveyer adapted to deliver cigarettes
45 thereto.

34. The combination of a revoluble drum; a conveyer belt thereon; a pair of cigarette-gripping jaws; means revoluble with said
50 drum for intermittently delivering cigarettes from said belt to said jaws; and means for closing said jaws upon receiving each cigarette.

35. The combination of a revoluble drum; a conveyer belt thereon provided with a plurality of cigarette holders; a pair of cigarette-gripping jaws; means revoluble with
55 said drum for delivering cigarettes from said holders to said gripping jaws; and means for closing said jaws upon the reception of a cigarette.
60 rette.

36. The combination of a revoluble drum; a conveyer belt thereon provided with a plurality of cigarette holders; a pair of cigarette-gripping jaws; means revoluble with
65 said drum for delivering cigarettes from said

holders to said gripping jaws; and a cam for closing said jaws upon the reception of a cigarette.

37. The combination of a conveyer belt; a revoluble drum; a pair of cigarette-gripping
70 jaws mounted thereon; and means revoluble with said drum for intermittently delivering thereto a cigarette from said conveyer belt.

38. The combination of a conveyer belt; a revoluble drum; a pair of cigarette-gripping
75 jaws; and cam-operated means revoluble with said drum for intermittently delivering thereto a cigarette from said conveyer belt.

39. The combination with a revoluble drum provided with a plurality of peripheral
80 depressions; of a plurality of cigarette-gripping jaws pivoted to said periphery and each provided with a depression cooperating with one of said peripheral depressions; and means to alternately open and close said
85 jaws during the revolution of said drum.

40. The combination with a revoluble drum provided with a plurality of peripheral
90 depressions; of a plurality of cigarette-gripping jaws pivoted to said periphery and each provided with a depression cooperating with one of said peripheral depressions; and a fixed cam to alternately open and close said
95 jaws during the revolution of said drum.

41. The combination with a revoluble
95 drum provided with a plurality of peripheral depressions; of a plurality of cigarette-gripping jaws pivoted to said periphery and each provided with a depression cooperating with one of said peripheral depressions; means
100 for opening and closing said jaws; devices for forming a tip for a cigarette and applying an adhesive thereto; and means for wrapping the tip about a cigarette during the revolution of said drum.
105

42. The combination with a revoluble drum provided with a plurality of peripheral
110 depressions; of a plurality of cigarette-gripping jaws pivoted to said periphery and each provided with a depression cooperating with one of said peripheral depressions; means to open and close said jaws; devices for cutting a portion of material to form a tip from a continuous strip; means for applying
115 an adhesive to said tip; and means for wrapping the tip about a cigarette during the revolution of said drum.

43. The combination with a revoluble drum; of a pair of cigarette-gripping jaws
120 mounted on the periphery thereof; a conveyer belt adapted to deliver cigarettes thereto; means to open and close said jaws; devices for cutting a portion from a continuous strip of material to form a tip for said cigarettes; means for applying an adhesive
125 to said tip; and means for wrapping the tip about a cigarette during the revolution of said drum.

44. The combination with a revoluble
130 drum; of a pair of cigarette-gripping jaws

mounted on the periphery thereof; a conveyer belt adapted to deliver cigarettes thereto; a fixed cam to open and close said jaws during the revolution of said drum; devices for cutting a portion from a continuous strip of material to form a tip for said cigarettes; means for applying an adhesive to said tip; and means for wrapping the tip about a cigarette during the revolution of said drum.

45. The combination of a revoluble drum; a pair of cigarette-gripping jaws mounted on the periphery thereof; a conveyer belt provided with a plurality of cigarette holders; means revoluble with said drum for delivering cigarettes to said jaws at a predetermined point in the revolution of said drum; and means for alternately opening and closing said jaws during the revolution of said drum.

46. The combination of a revoluble drum; a pair of cigarette-gripping jaws mounted on the periphery thereof; a conveyer belt adapted to deliver cigarettes thereto; means for opening and closing said jaws; means for feeding a blank adapted to form a tip for a cigarette; a device for applying an adhesive thereto; and means for wrapping the tip about the cigarette during the revolution of said drum.

47. The combination of a revoluble drum; a pair of cigarette-gripping jaws mounted on the periphery thereof; a conveyer belt adapted to deliver cigarettes thereto; means to open and close said jaws; a device for cutting a portion from a continuous strip of material to form a tip; means for applying an adhesive thereto; means for gripping both ends of said tip; and means for wrapping the tip about a cigarette during the revolution of said drum.

48. The combination of a revoluble drum; a pair of cigarette-gripping jaws thereon; a conveyer belt; means revoluble with said drum to intermittently deliver a cigarette therefrom to said jaws; and means for immediately closing said jaws thereon upon the delivery thereto of a cigarette.

49. The combination of a revoluble drum; a plurality of radial slides thereon; a cam for operating said slides; a pair of members pivoted to each of said slides adapted to wrap a tip about a cigarette suitably positioned; and means for operating said members alternately.

50. The combination of a revoluble drum; a plurality of radial slides thereon; a cam for operating said slides; a pair of members pivoted to each of said slides adapted to wrap a tip about a cigarette suitably positioned; and fixed stops in the circular path of said wrapping members for operating them alternately.

51. The combination of a revoluble drum; a plurality of radial slides thereon; a cam

for operating said slides; a pair of members pivoted to each of said slides adapted to wrap a tip about a cigarette suitably positioned; a pinion on the shaft of each member; a gear meshing with each pinion; an arm radiating from each shaft secured to each gear; and stops in the circular path of each arm to operate said members alternately.

52. The combination of a revoluble drum; a plurality of radial slides thereon; a cam for operating said slides; a pair of members pivoted to each of said slides adapted to wrap a tip about a cigarette suitably positioned; a pinion on the shaft of each member; a gear meshing with each pinion; an arm radiating from each shaft adjustably secured to each gear; and stops in the circular path of each arm to operate said members alternately.

53. The combination of a revoluble drum; a plurality of radial slides thereon; a cam for operating said slides; a pair of members pivoted to each of said slides adapted to wrap a tip about a cigarette suitably positioned; an arm radiating from the shaft of each member; and fixed stops in the circular path of said wrapping members for operating them alternately.

54. The combination of a revoluble drum; a plurality of radial slides thereon; a cam for operating said slides; a pair of members pivoted to each of said slides adapted to wrap a tip about a cigarette suitably positioned; an arm radiating from the shaft of each member; fixed stops in the circular path of said wrapping members for operating them alternately; and springs to return said members to their normal position.

55. The combination of a revoluble drum; a plurality of radial slides thereon; a cam for operating said slides; a pair of members pivoted to each of said slides adapted to wrap a cigarette suitably positioned; means for operating said members alternately; a support for the end of a cigarette in the end of each slide between said wrapping members; and a stop to register the end of said cigarette.

56. The combination of a revoluble drum; a plurality of radial slides thereon; a cam for operating said slides; a pair of members pivoted to each of said slides adapted to wrap a cigarette suitably positioned; means for operating said members alternately; a support for the end of a cigarette in the end of each slide between said wrapping members; and a yielding stop to register the end of said cigarette.

57. The combination of a revoluble drum; a plurality of radial slides thereon; a cam for operating said slides; a pair of members pivoted to each of said slides adapted to wrap a cigarette suitably positioned; means for operating said members alternately; a support for the end of a cigarette in the end

of each slide between said wrapping members; a stop plate to register the end of said cigarette; a rod secured thereto mounted in guides; and a spring thereon.

5 58. The combination of a revoluble drum provided with a plurality of peripheral depressions; a plurality of cooperating cigarette-gripping jaws each pivoted to the periphery of said drum and provided with a
10 depression cooperating with one of said peripheral depressions; a fixed cam for closing each of said jaws at a predetermined point, and a spring for holding each of said jaws normally opened.

15 59. The combination of a revoluble drum; a plurality of cigarette-gripping jaws on the periphery thereof; a fixed cam for closing said jaws; a spring for holding each of said jaws normally opened; and a stop to limit
20 the opening of said jaws.

60. The combination of a revoluble drum; a plurality of cigarette-gripping jaws on the periphery thereof; a fixed cam for closing said jaws; a spring for holding each of said
25 jaws normally opened; and a stop secured to each of said jaws to limit the opening thereof.

61. The combination of a revoluble drum provided with a plurality of peripheral depressions; a plurality of cigarette-gripping
30 jaws each pivoted to the periphery of said drum and provided with a depression cooperating with a peripheral depression; an arm on the pivot of each jaw; a fixed cam cooperating with said arms for closing said
35 jaws; and a spring for holding each of said jaws normally opened.

62. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
40 operate said slides; and a cutting mechanism secured thereon provided with blades adapted to be operated at a predetermined time by the movement of said slide.

63. The combination of a revoluble drum;
45 a plurality of slides thereon; a fixed cam to operate said slides; a frame secured to said slide; a blade fixed thereto; a companion blade; a rod pivotally mounted in said frame on which said companion blade is mounted;
50 and means for moving said blades relative to each other to secure a shearing cut.

64. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
55 operate said slides; a frame secured to said slide; a blade fixed thereto; a companion blade; a rod pivotally mounted in said frame on which said companion blade is mounted; means for moving said blades relative to each other to secure a shearing cut; and means
60 for returning said rod to its normal position during the revolution of said drum.

65. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
65 operate said slides; a frame secured to said slide; a blade fixed thereto; a companion

blade; a rod pivotally mounted in said frame on which said companion blade is mounted; means for moving said blades relative to each other to secure a shearing cut; and a cam for returning said rod to its normal position.

70 66. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to operate said slides; a frame secured to said slide; a blade fixed thereto; a companion
75 blade; a rod pivotally mounted in said frame on which said companion blade is mounted; means for moving said blades relative to each other to secure a shearing cut; and a spring for moving said rod about its axis to cause a locking of said blades when in non-operating
80 position.

67. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
85 operate said slides; a frame secured to said slide; a blade fixed thereto; a companion blade; a rod pivotally mounted in said frame on which said companion blade is mounted; means for moving said blades relative to each other to secure a shearing cut; an arm on said
90 rod; and a stop co-acting therewith to move said rod about its axis to permit the blades to move toward each other to effect a cutting.

68. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
95 operate said slides; a pair of tip grippers thereon; and means carried by said slides for operating said grippers.

69. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
100 operate said slides; a pair of tip grippers thereon; and a spring carried by said slides for operating said grippers.

70. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
105 operate said slides; a pair of tip grippers thereon; a spring carried by said slides for operating said grippers; and a cam for separating said grippers.

71. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
110 operate said slides; a pair of tip grippers thereon; a spring carried by said slides for operating said grippers; a cam for separating said grippers; and a latch for retaining said grippers in separated position.
115

72. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
120 operate said slides; a pair of tip grippers thereon; a spring carried by said slides for operating said grippers; a cam for separating said grippers; a latch for retaining said grippers in separated position; and a spring for disengaging said latch.

73. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to
125 operate said slides; a pair of tip grippers thereon; a spring carried by said slides for operating said grippers; a cam for separating said grippers; a latch for retaining said grippers in separated position; a spring for
130

disengaging said latch; an arm secured to said latch; and a fixed stop adapted to engage said arm to lock said latch.

74. The combination of a revoluble drum; a plurality of slides thereon; a fixed cam to operate said slides; a pair of tip grippers thereon; means carried by said slides for operating said grippers; and a spring member secured to the upper gripper adapted to assist in holding the opposite end of said tip.

75. The combination of devices for feeding a strip of material consisting in part of a positively-driven paste roll; means for applying paste thereto; a spring operated piv-

oted lever; a roller mounted in the end thereof for holding the strip in contact with said paste roll during its passage over said paste roll; cutting devices for severing from said strip portions adapted to serve as tips for cigarettes; and devices for gripping a cigarette and wrapping said tip thereon.

Signed by me at Boston, Mass., this 20th day of March, 1907.

JAMES N. TZIBIDES.

Witnesses:

WALTER E. LOMBARD,
EDNA C. CLEVELAND.