

(No Model.)

18 Sheets—Sheet 1.

B. BARON.  
CONTINUOUS CIGARETTE MACHINE.

No. 555,417.

Patented Feb. 25, 1896.

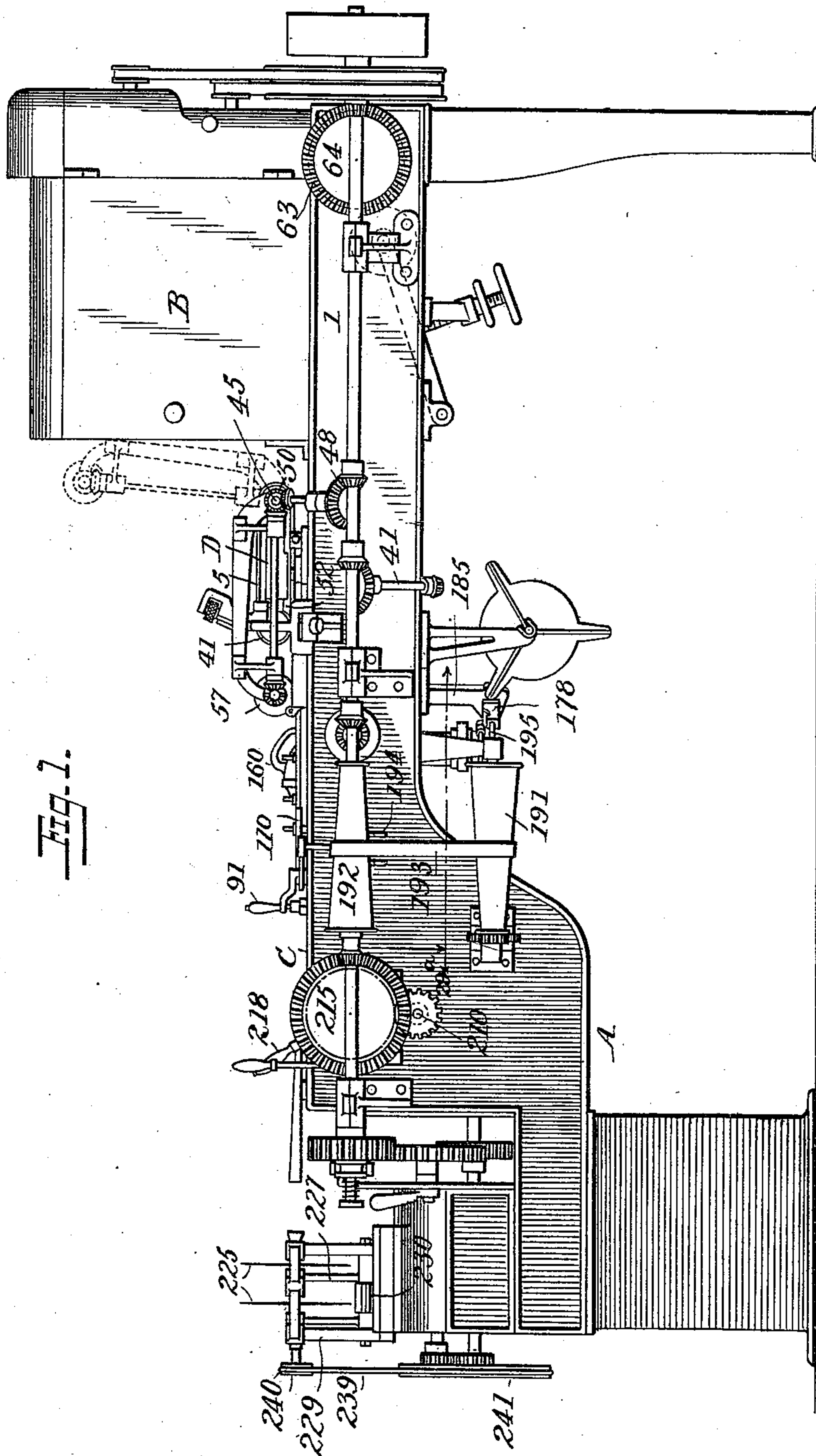


Fig. 1.

Witnesses  
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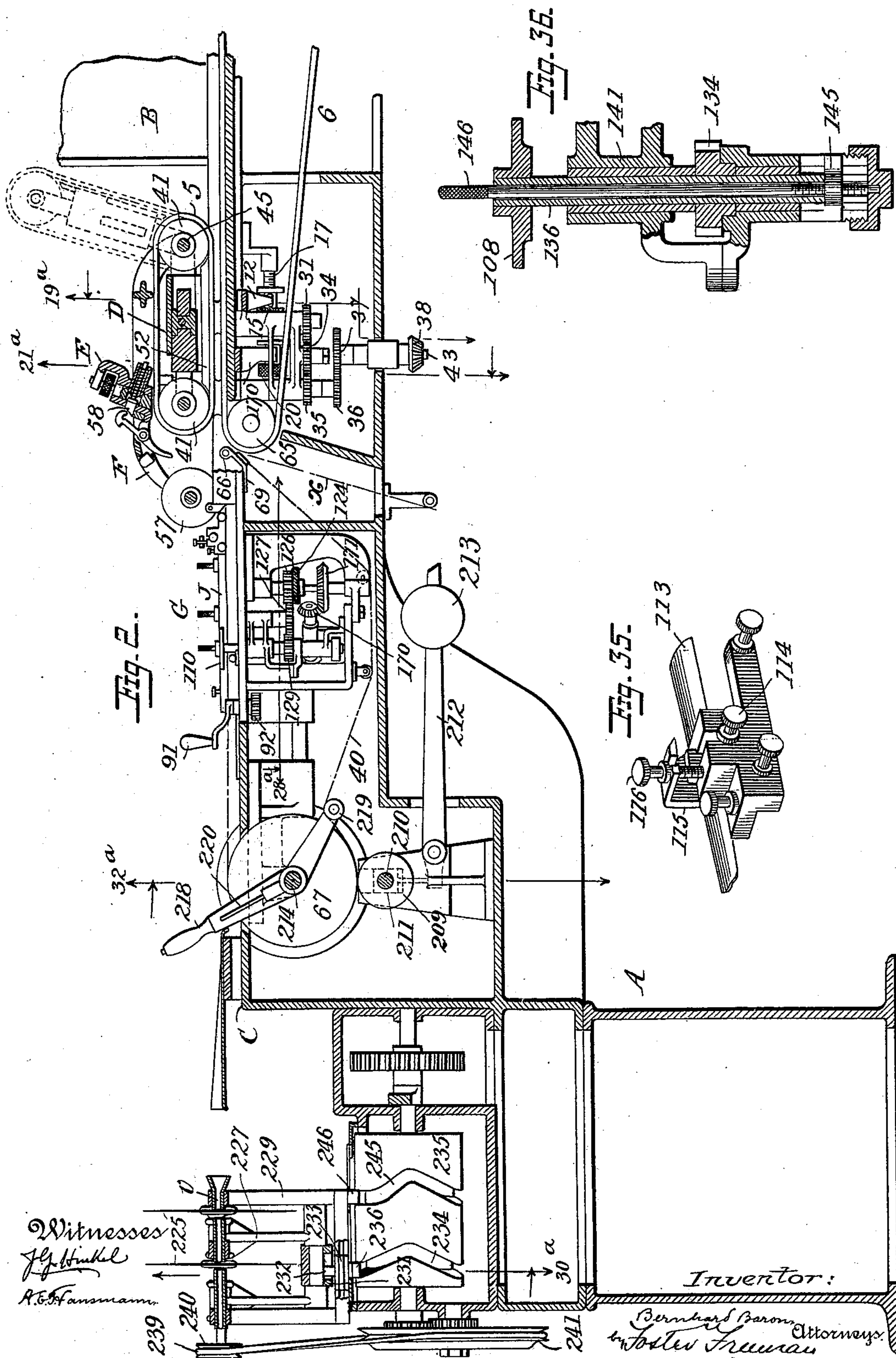
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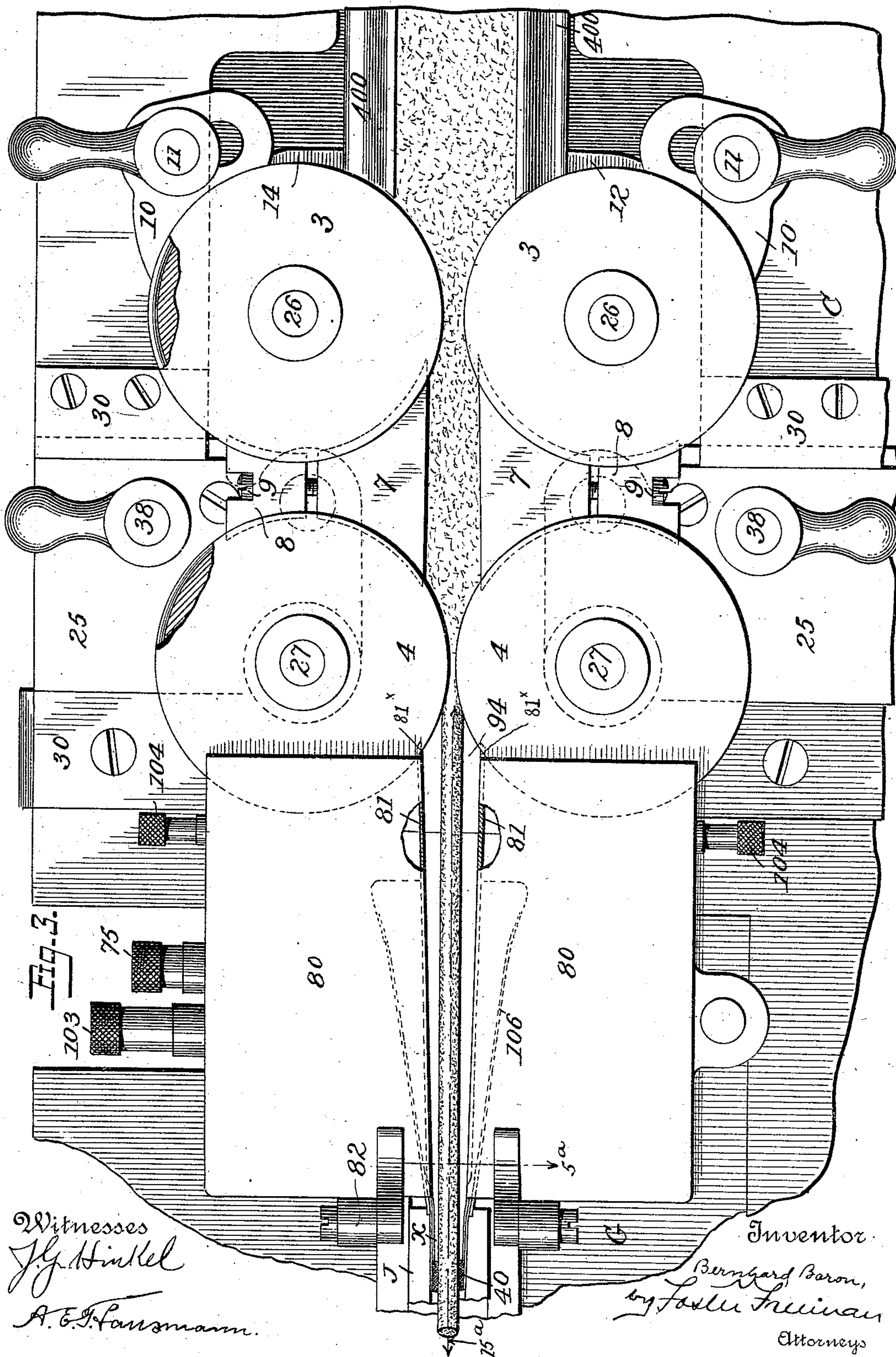
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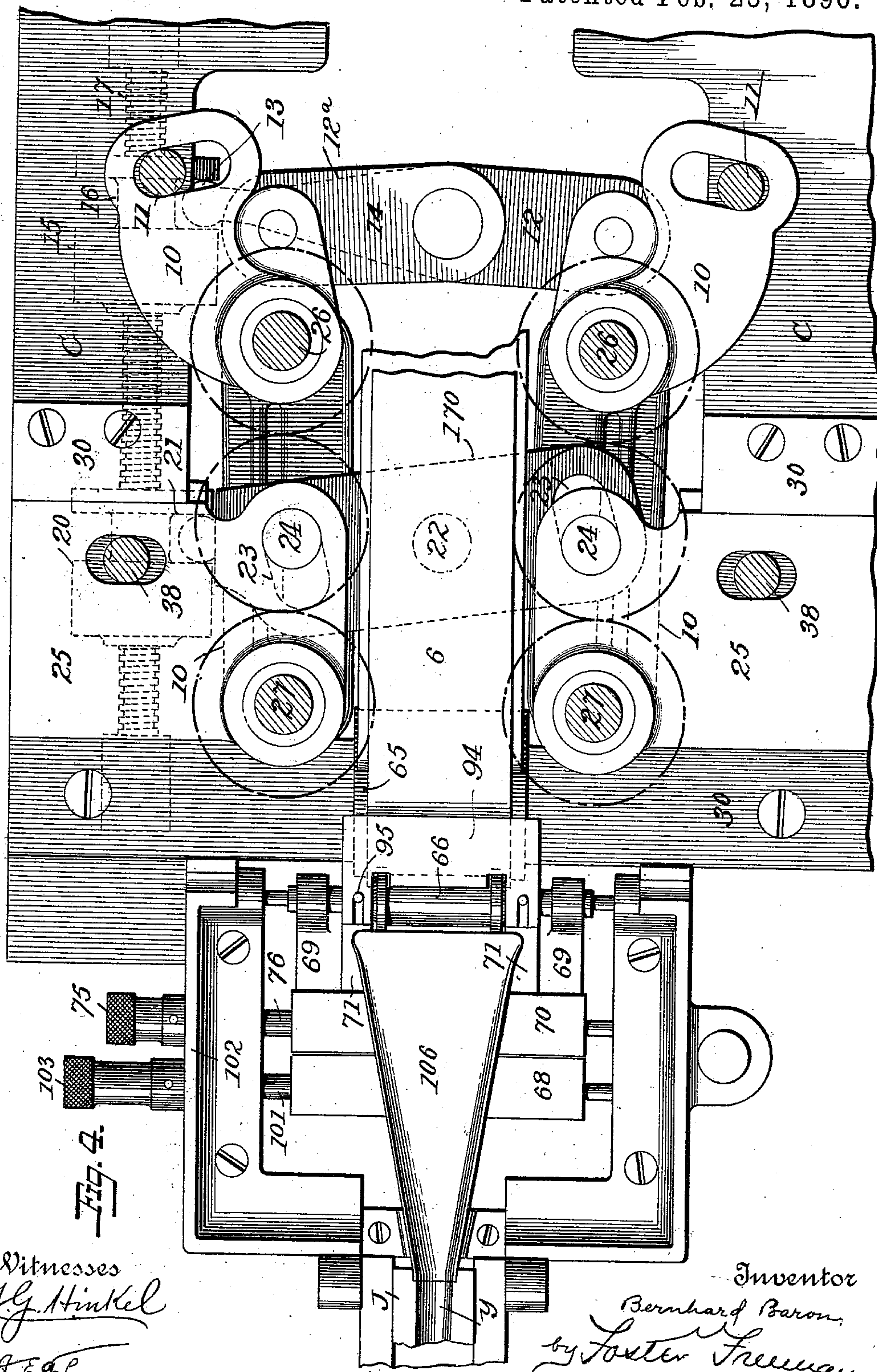
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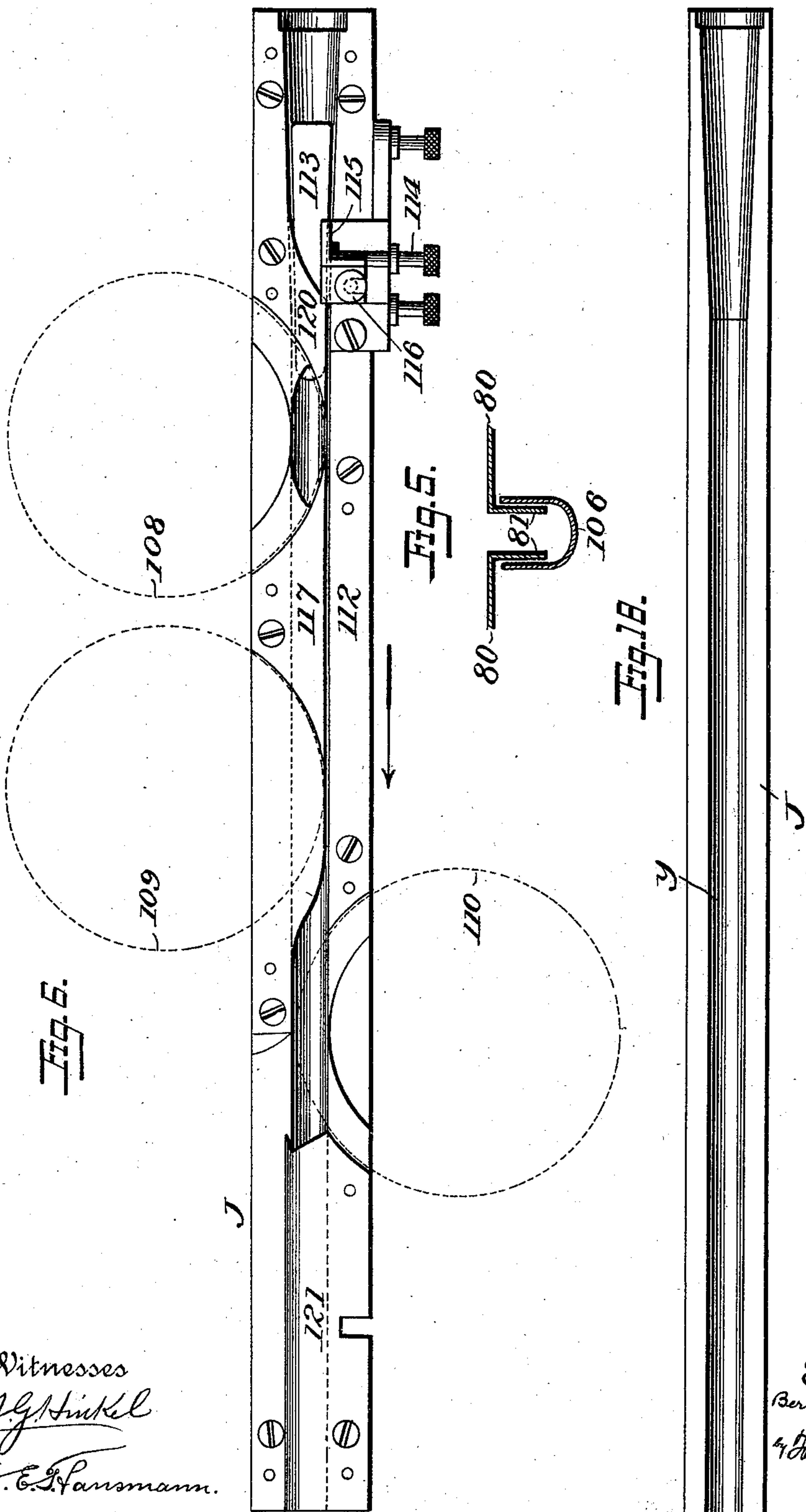
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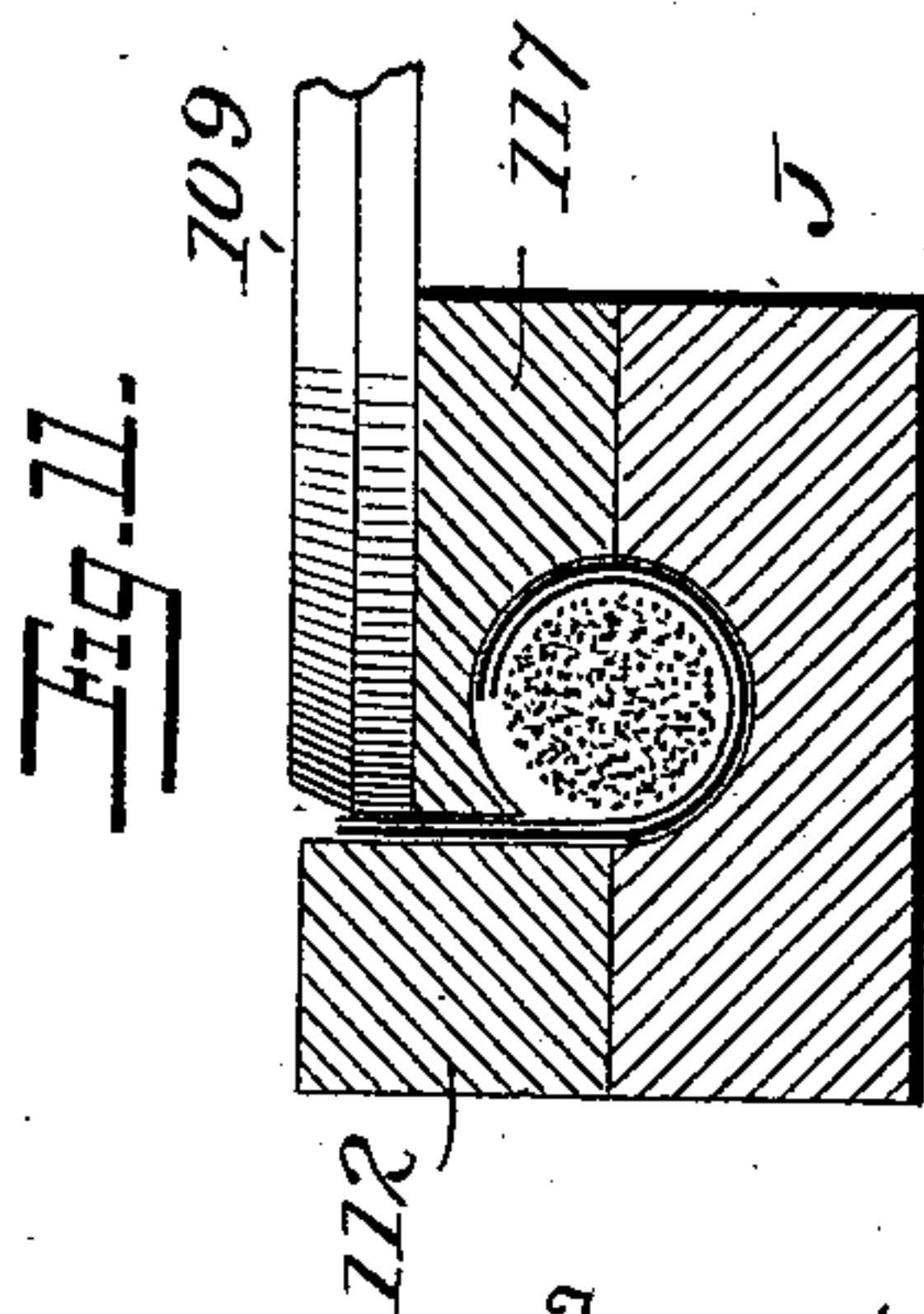
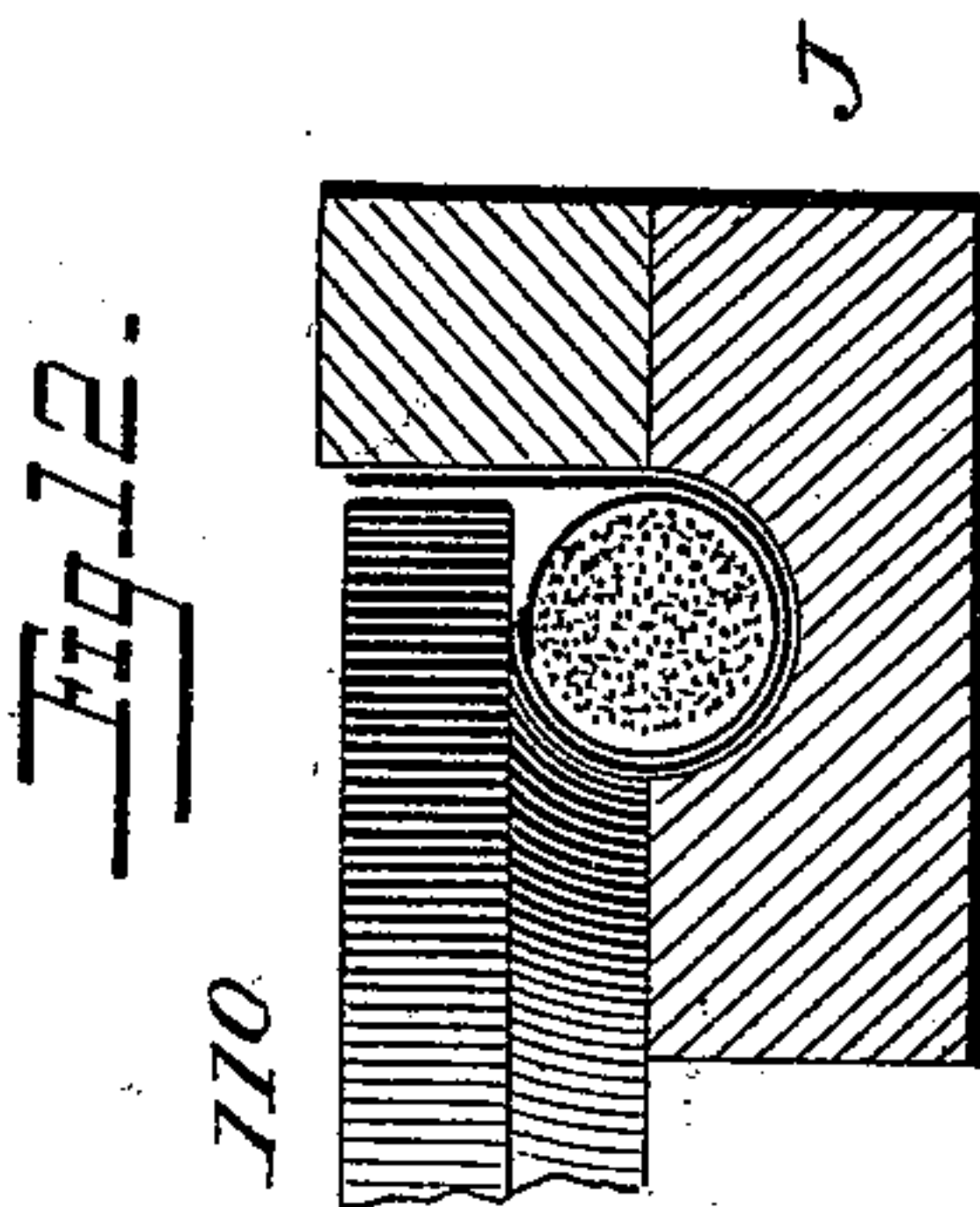
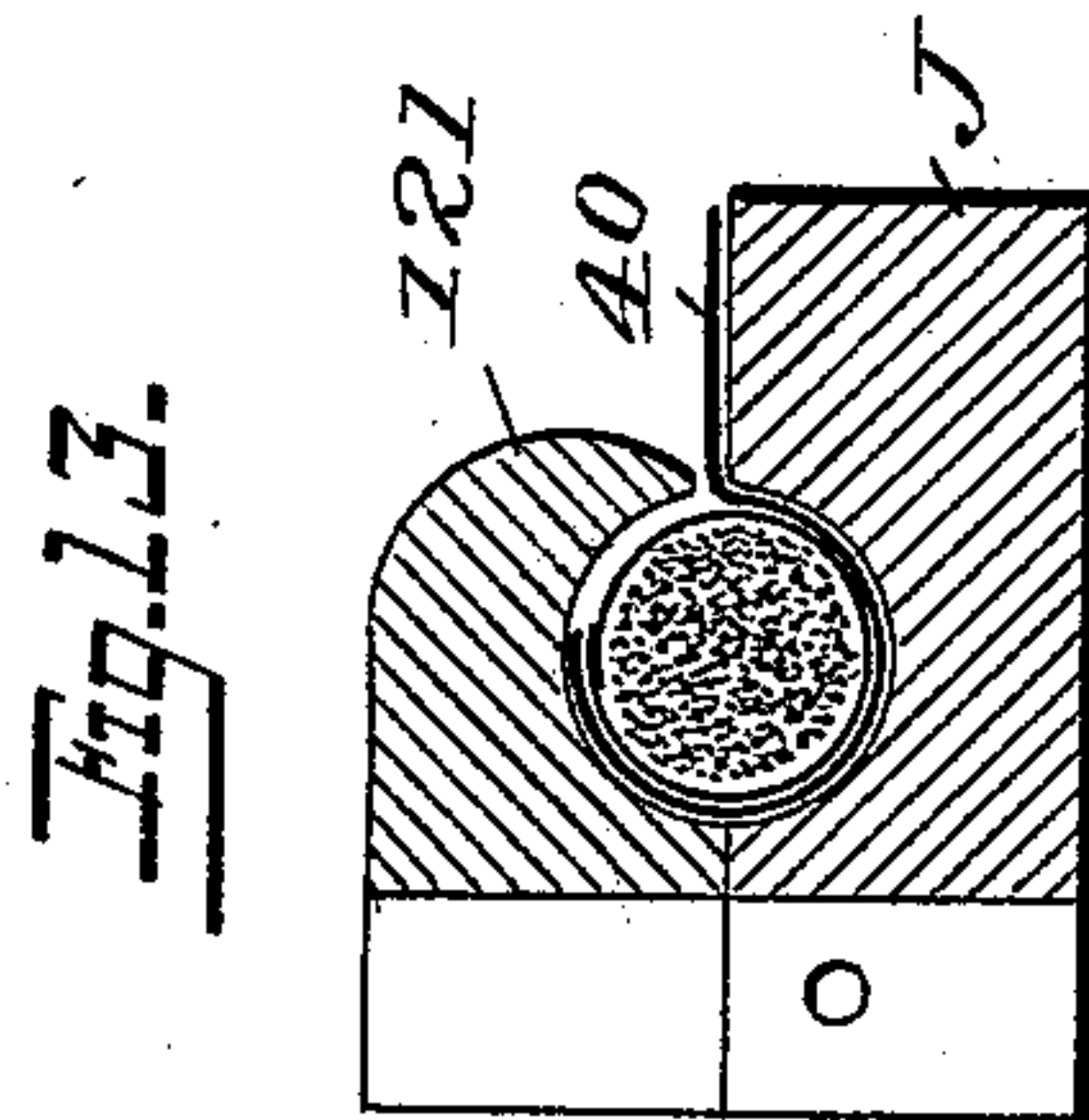
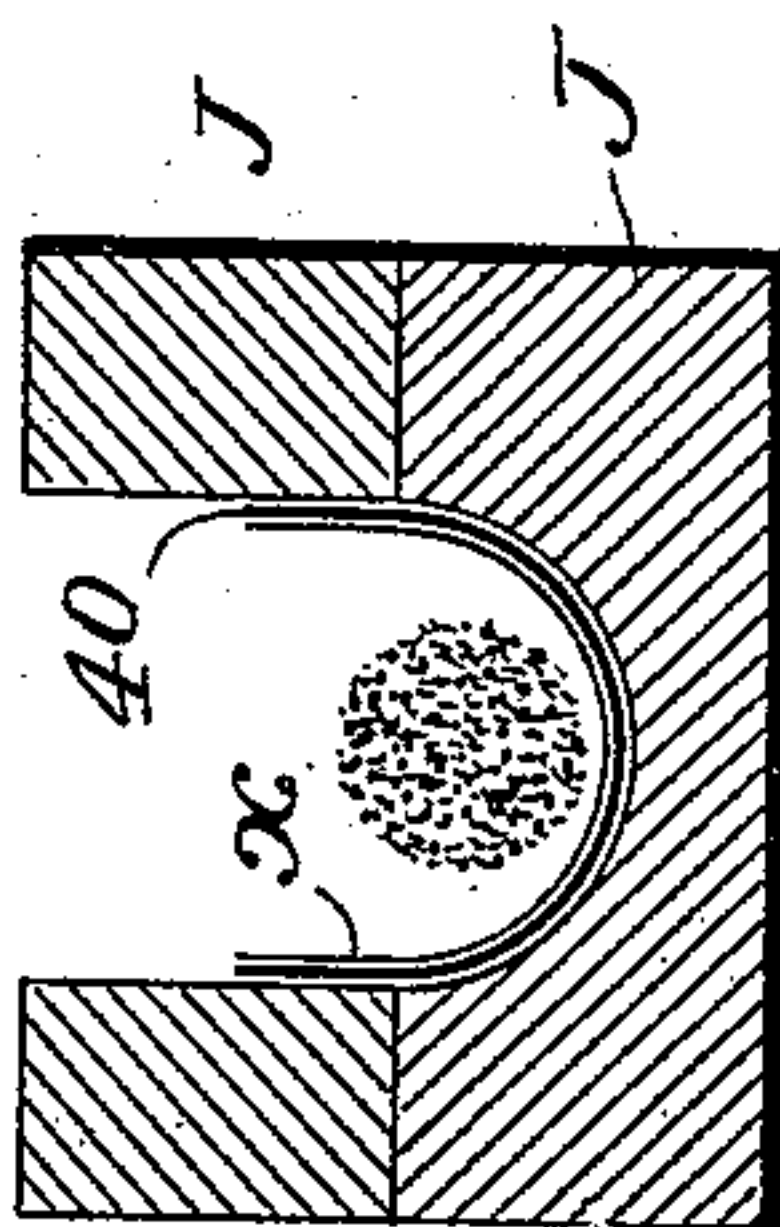
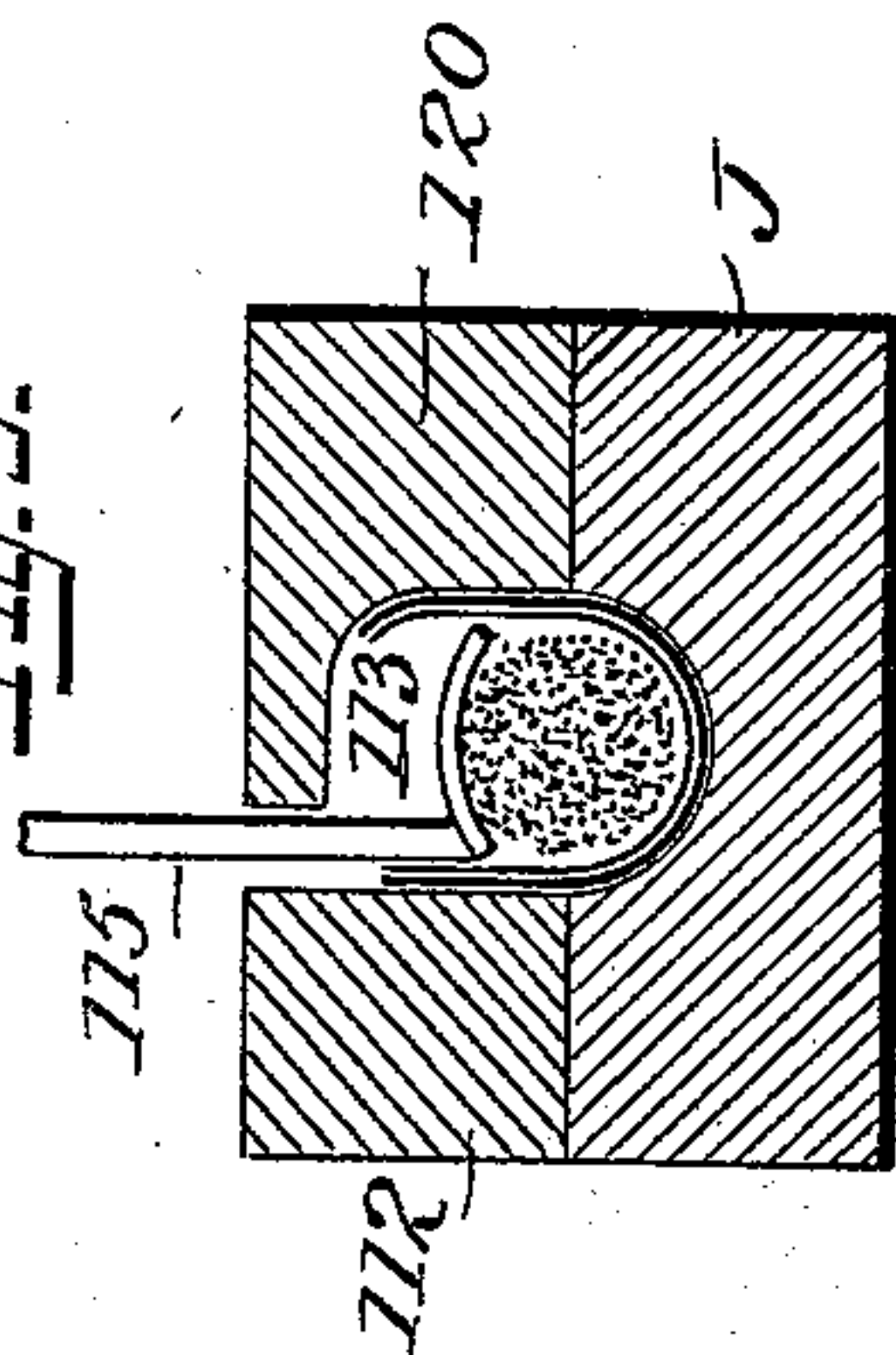
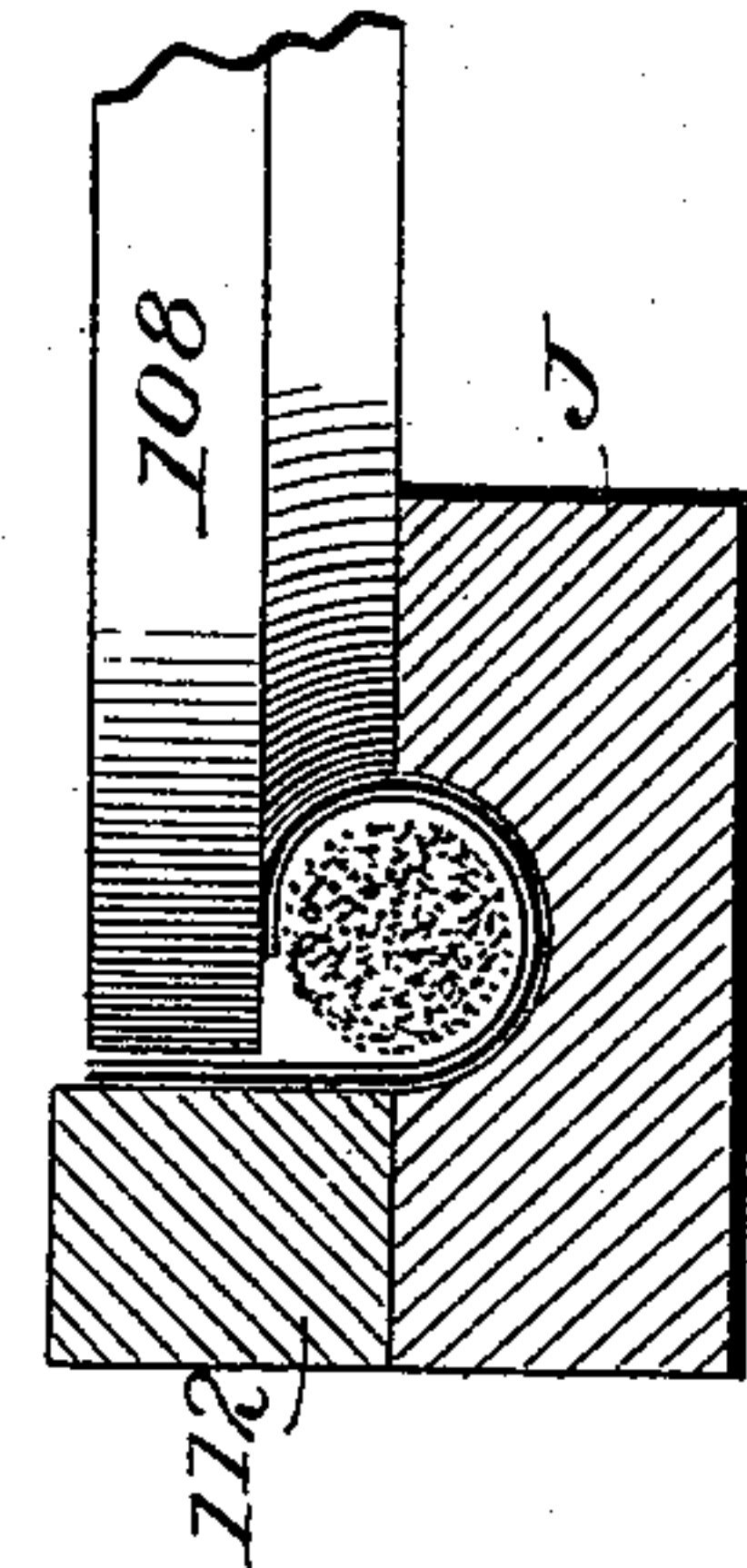
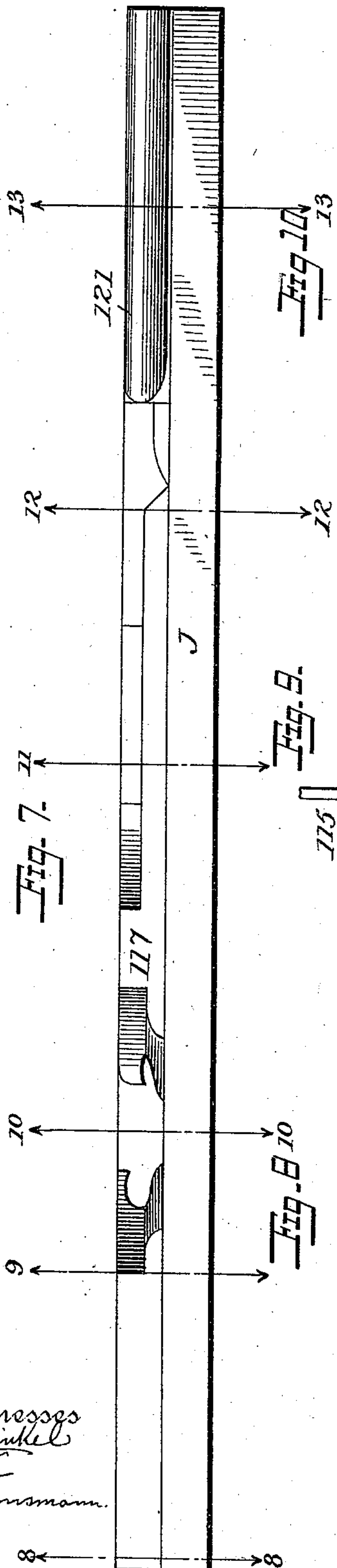
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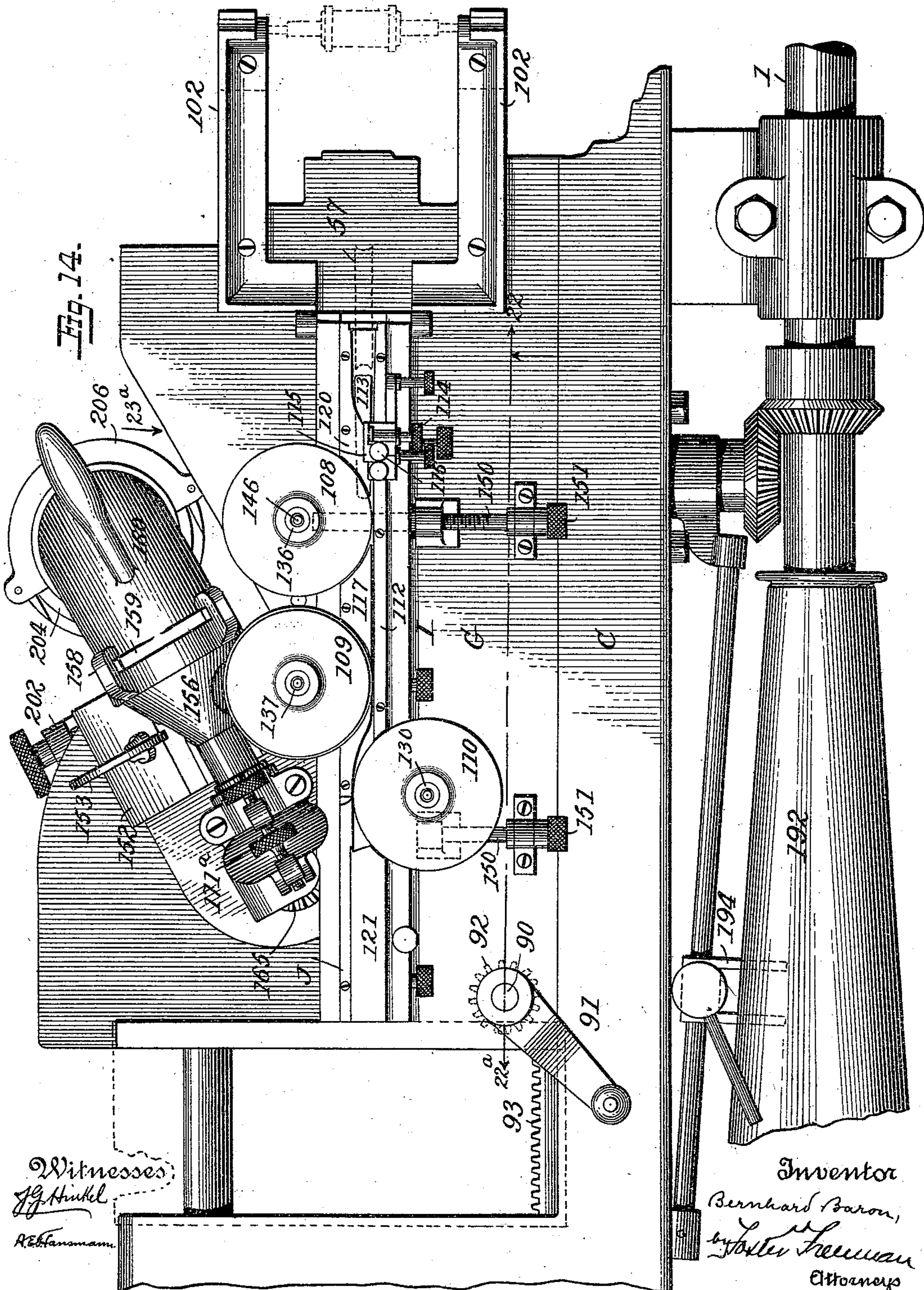
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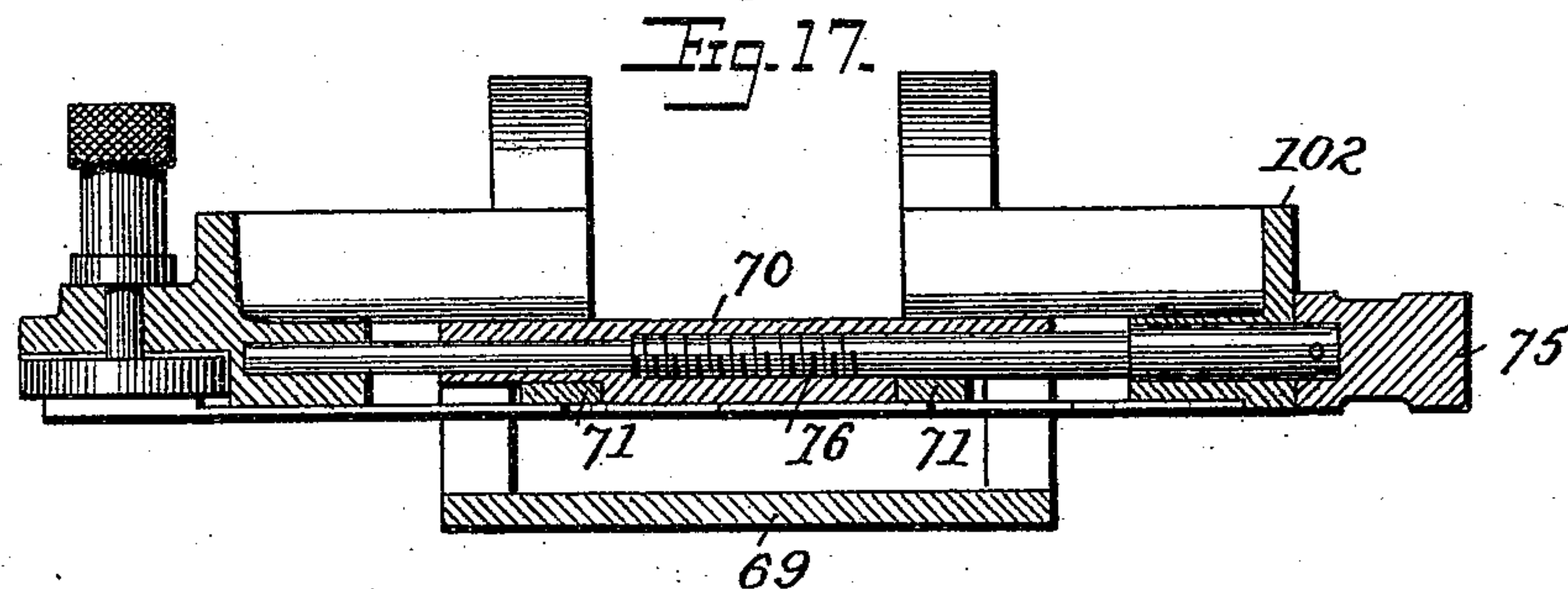
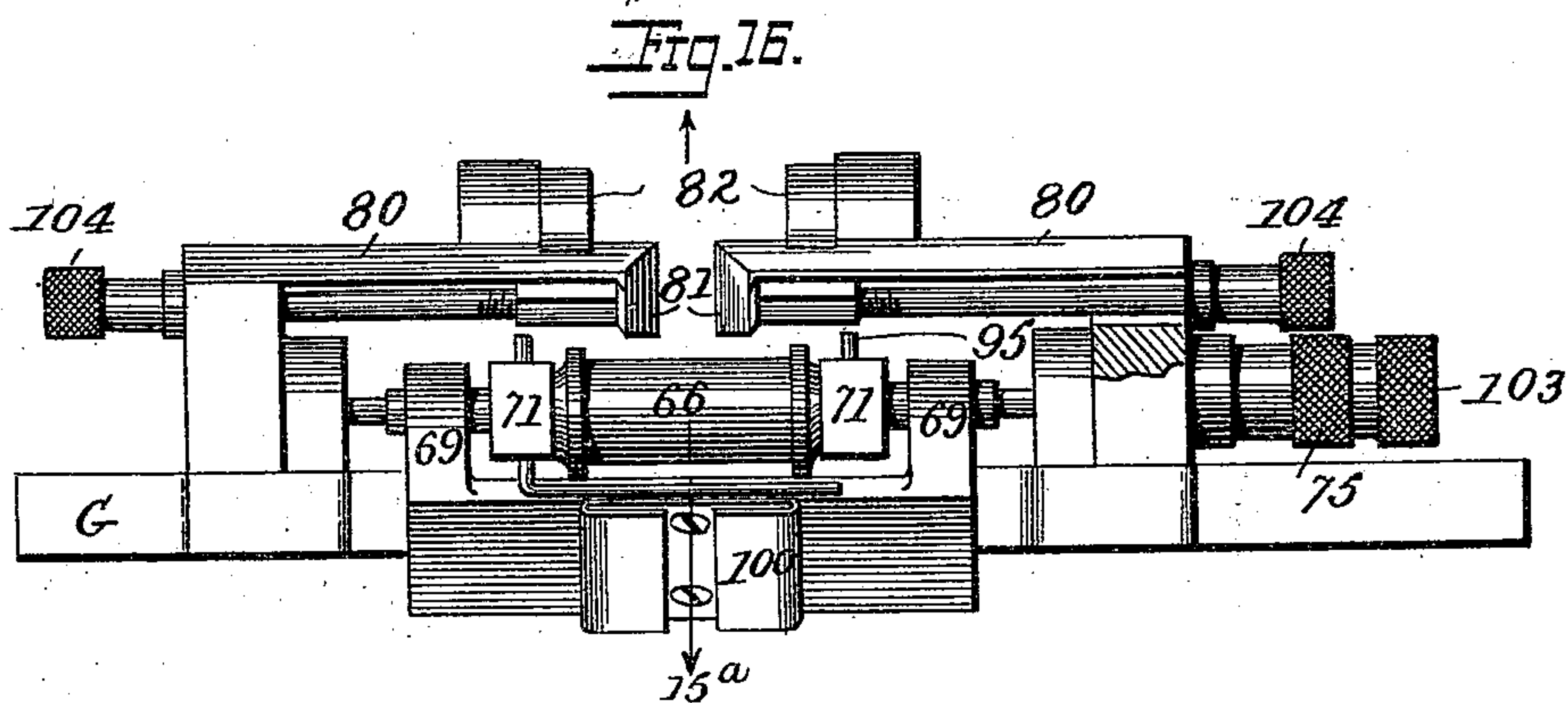
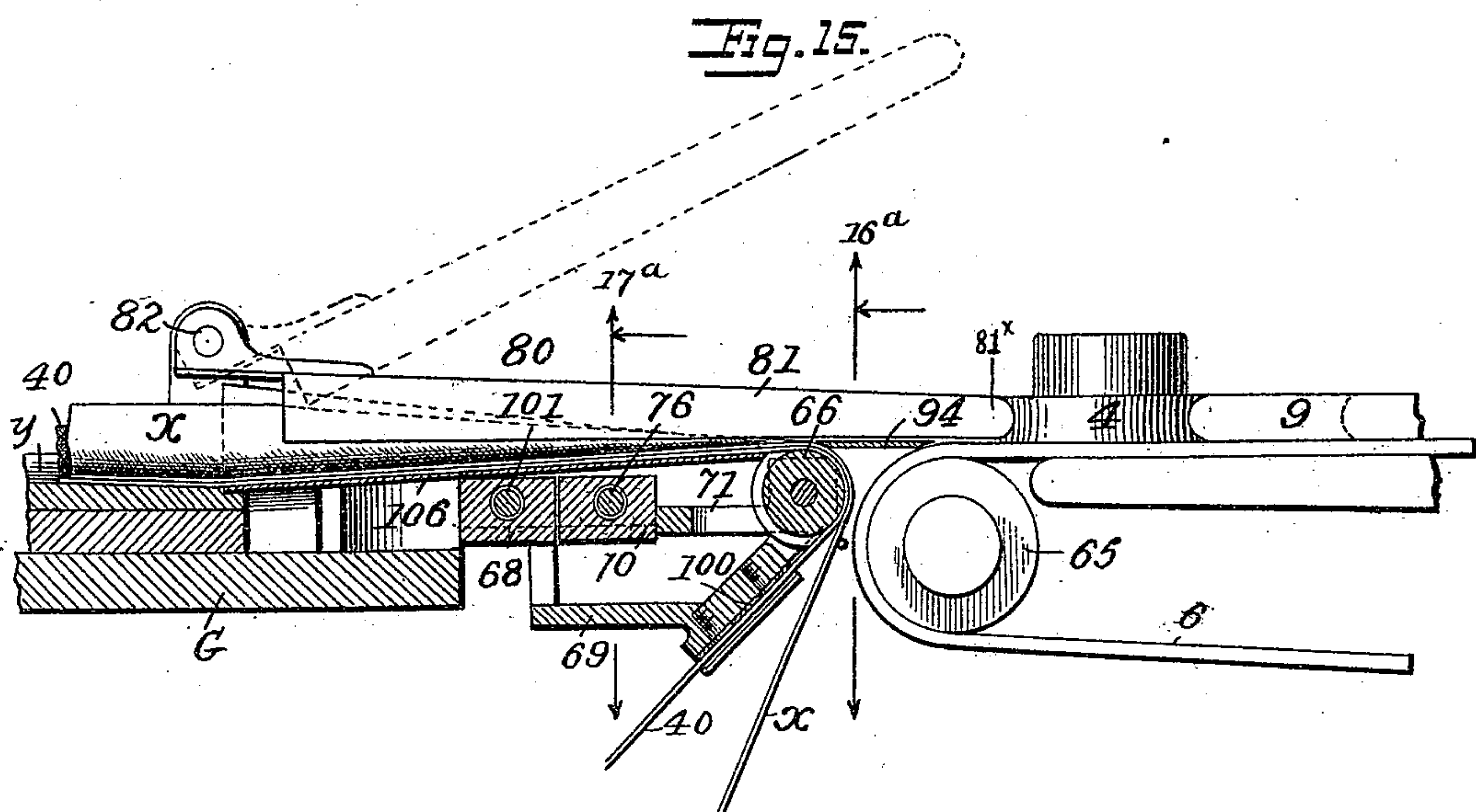
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Fig. 20.

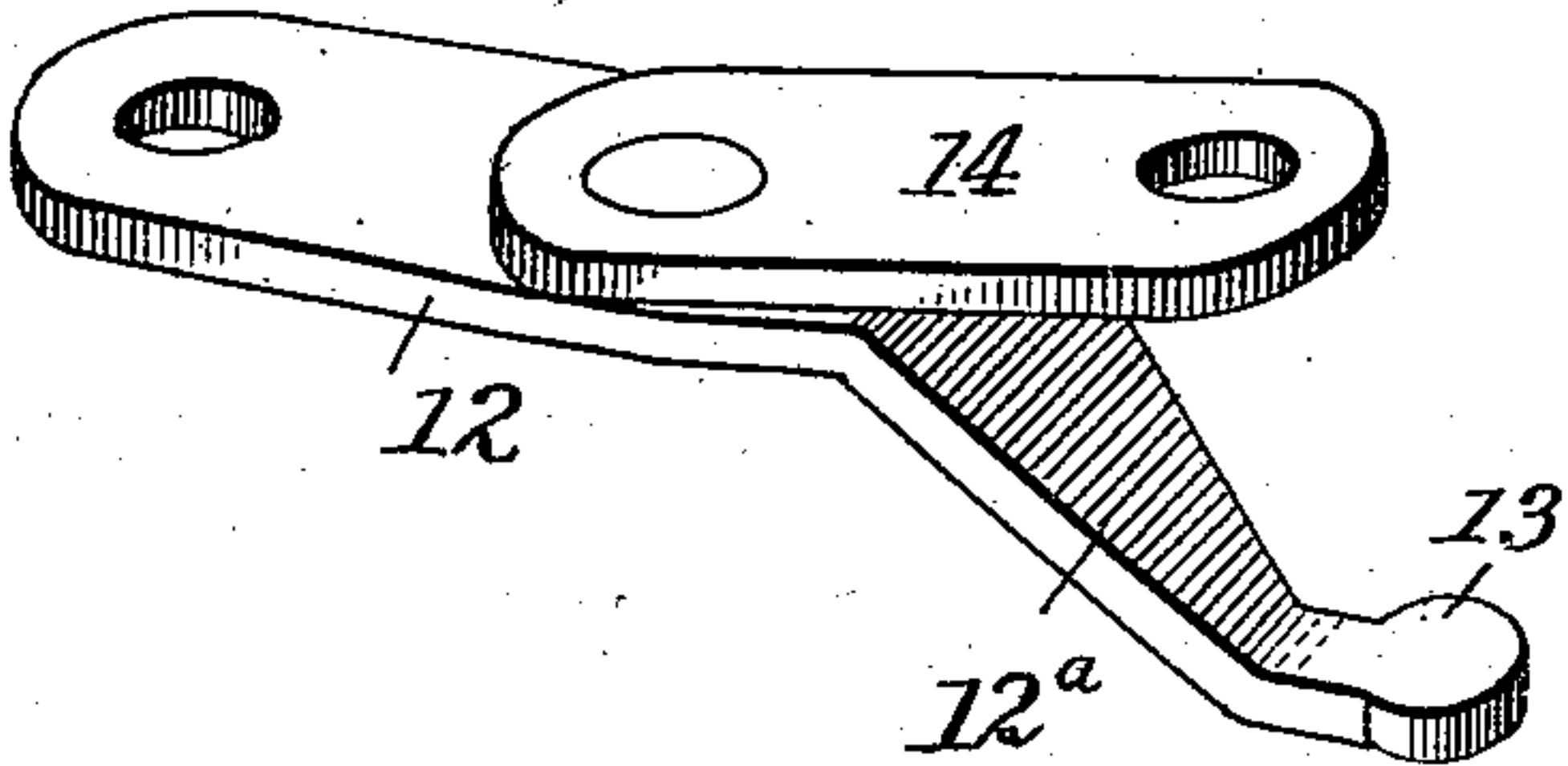
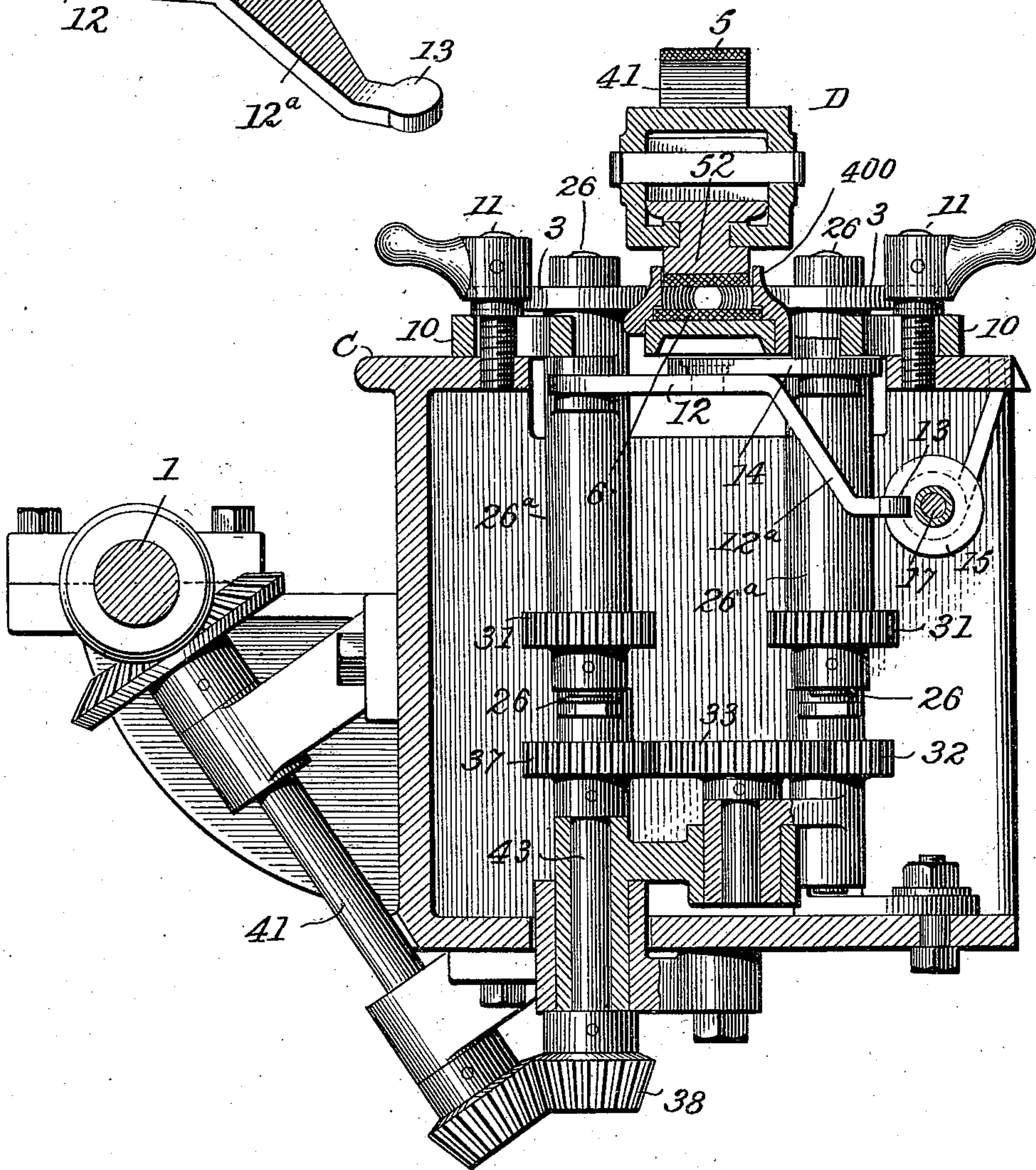


Fig. 19.



Witnesses  
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(No Model.)

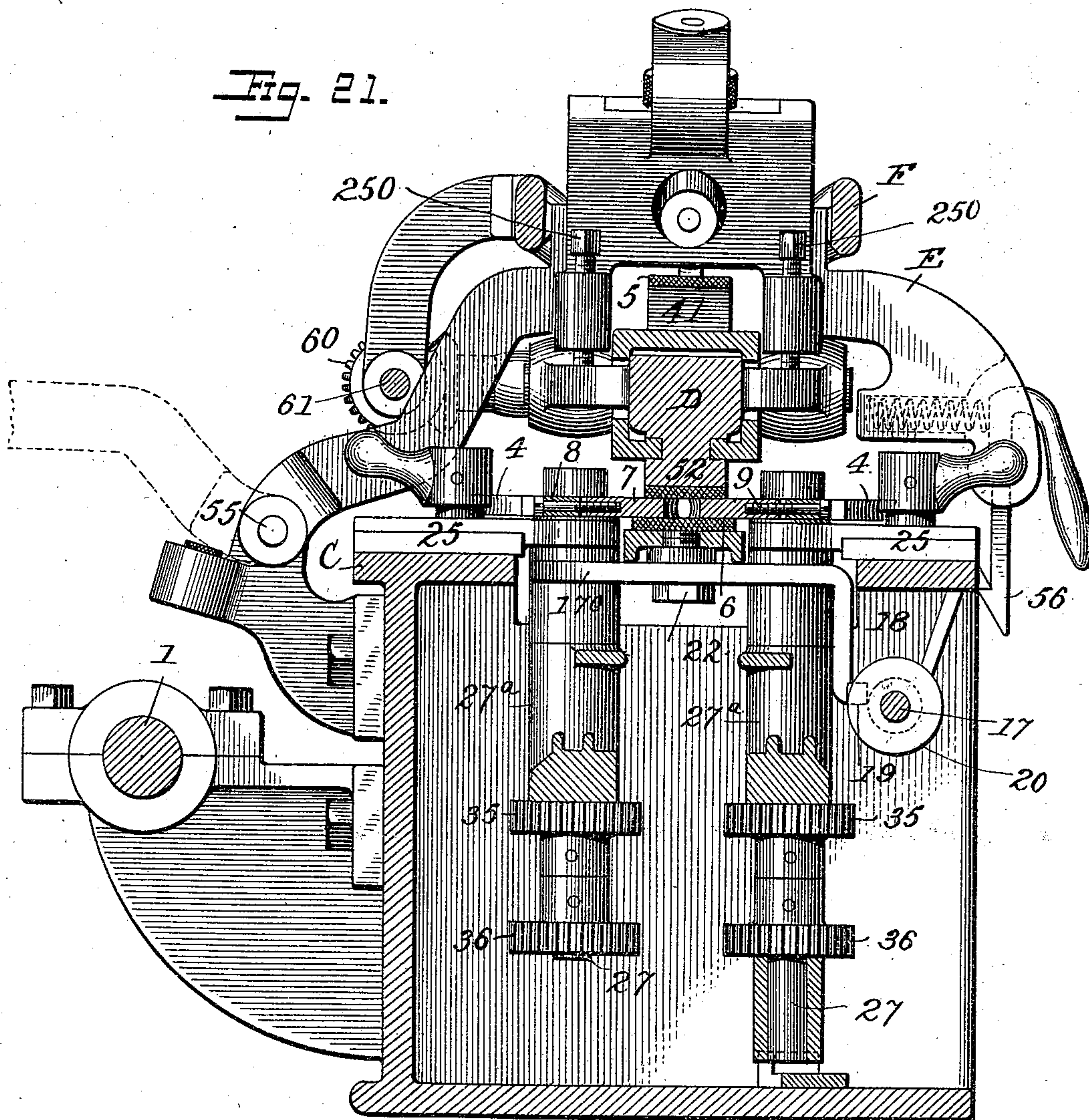
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Fig. 21.



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(No Model.)

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Fig. 22.

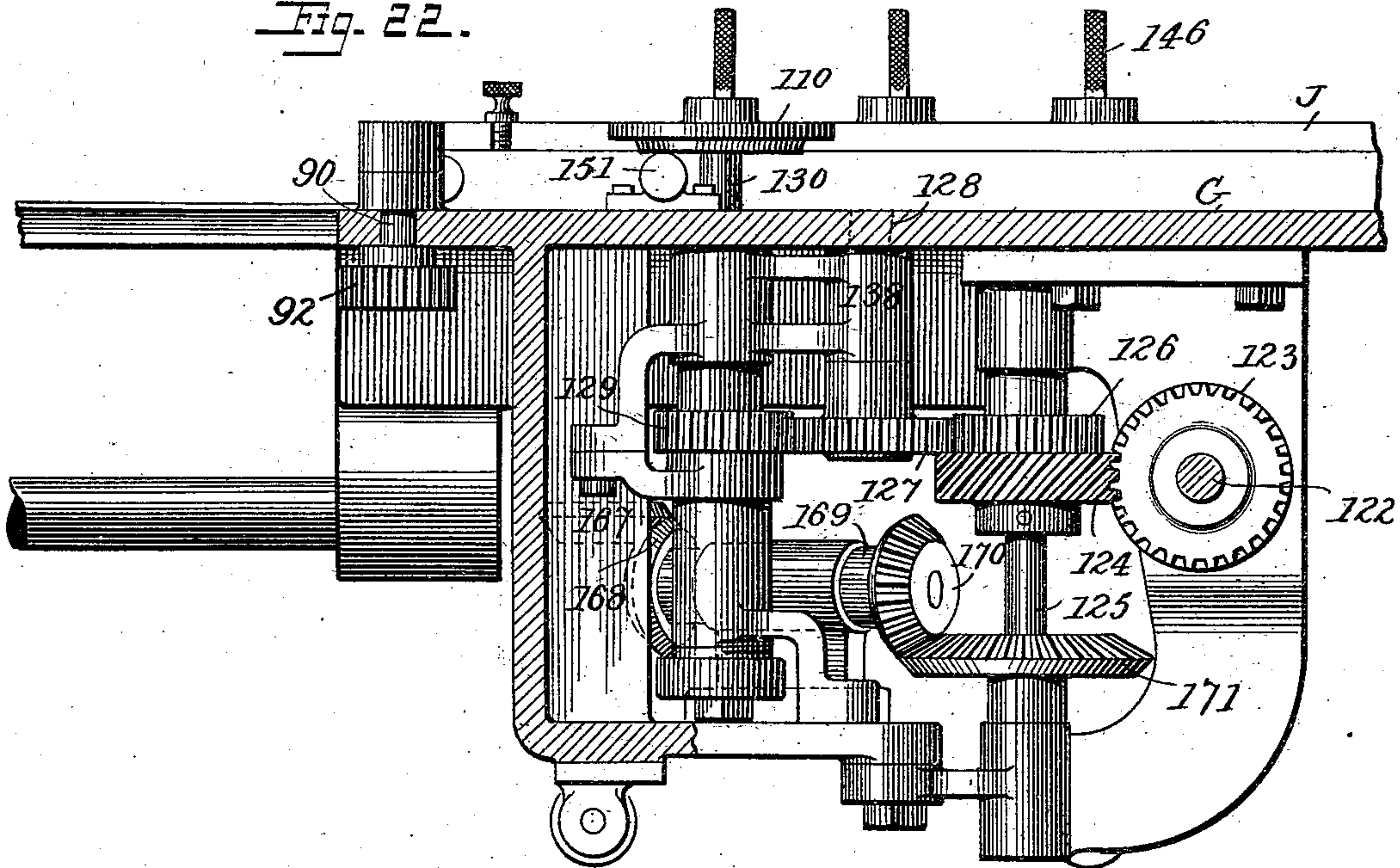
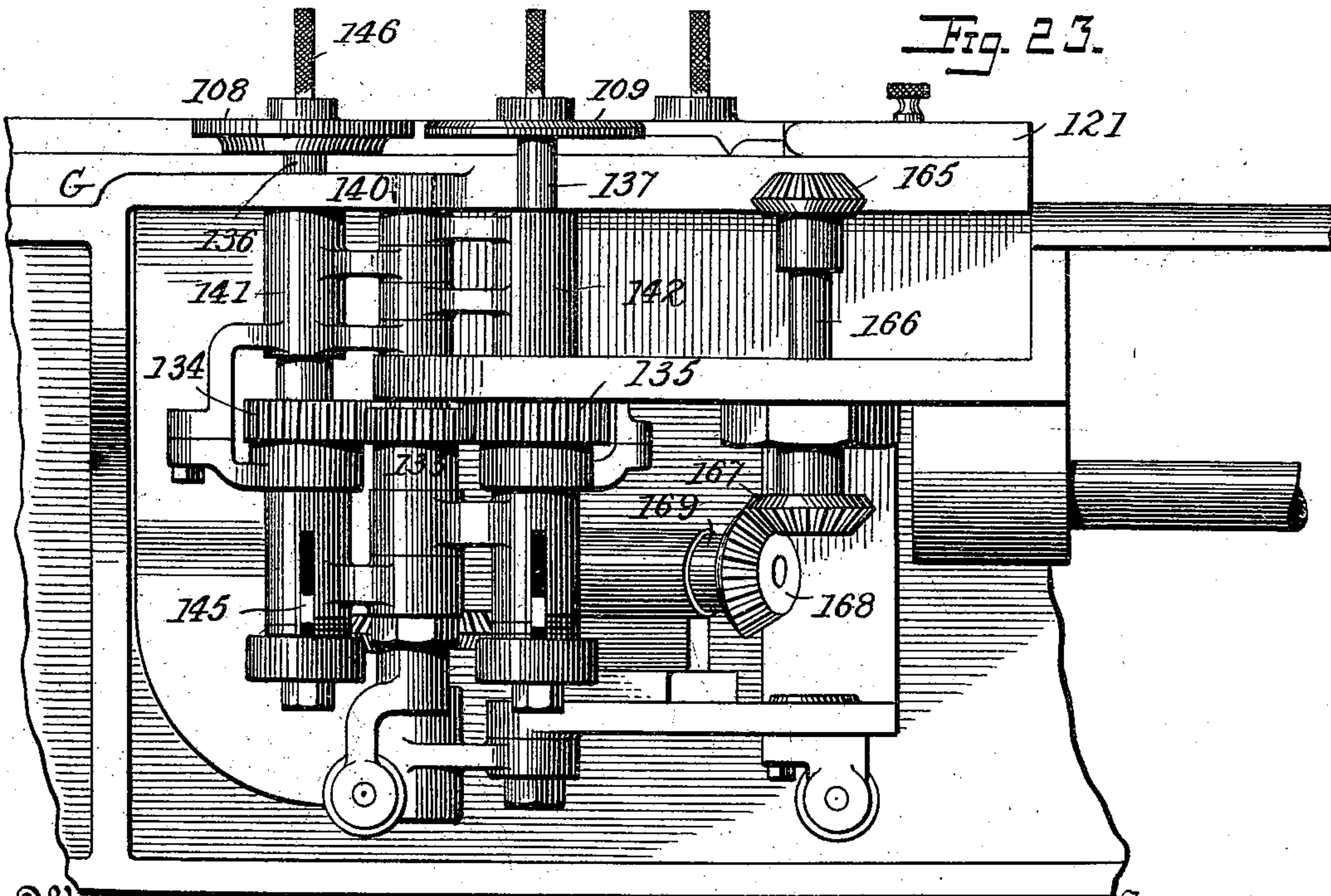


Fig. 23.



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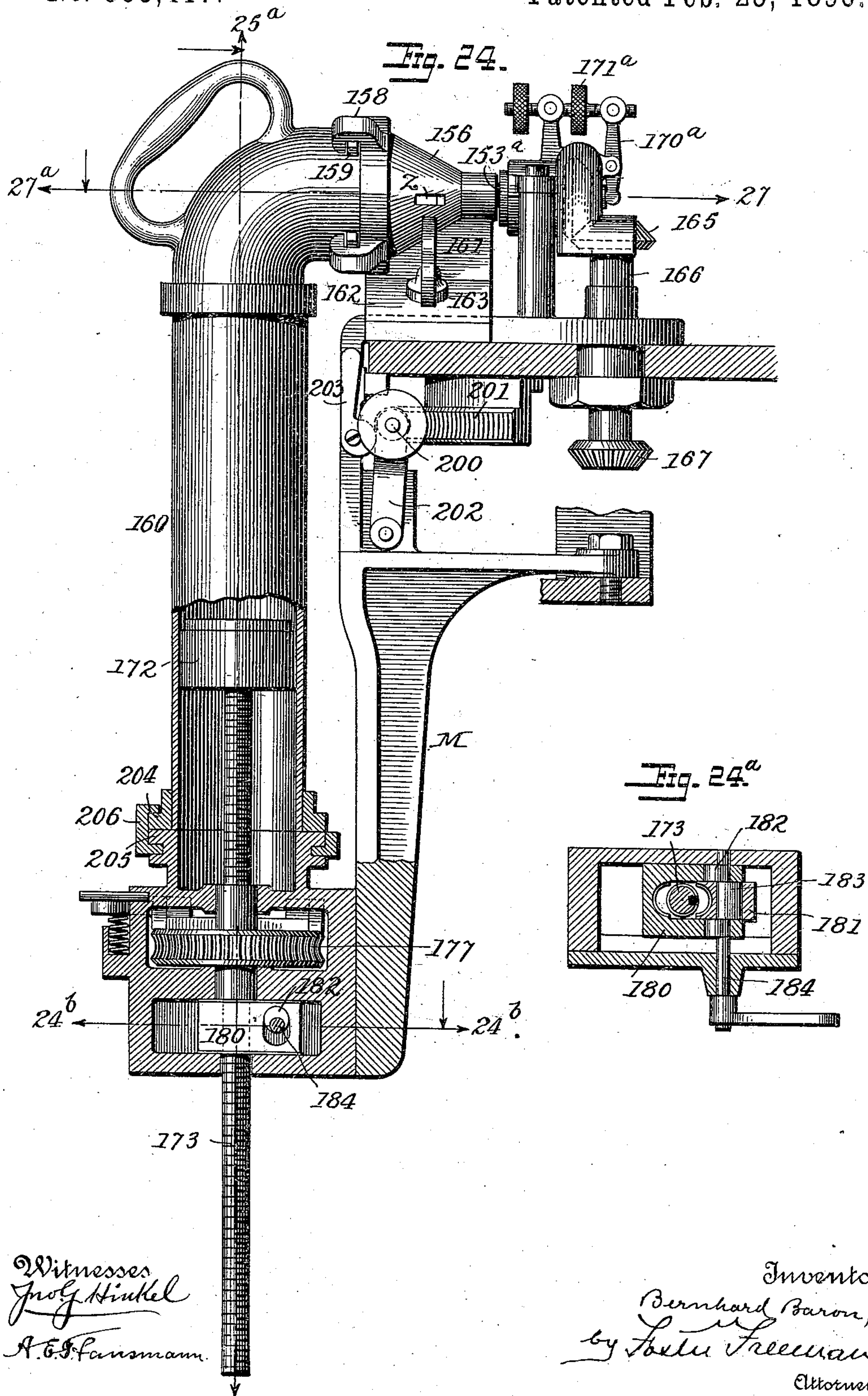
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Fig. 25.

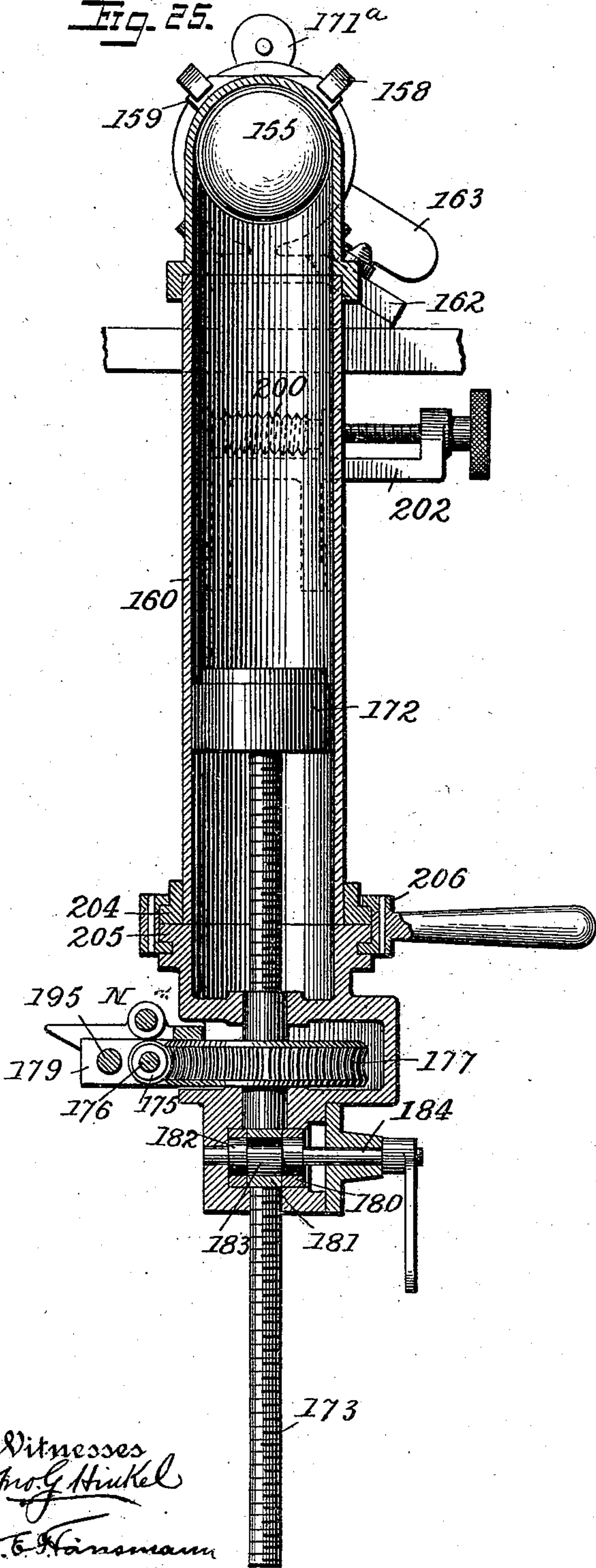


Fig. 26.

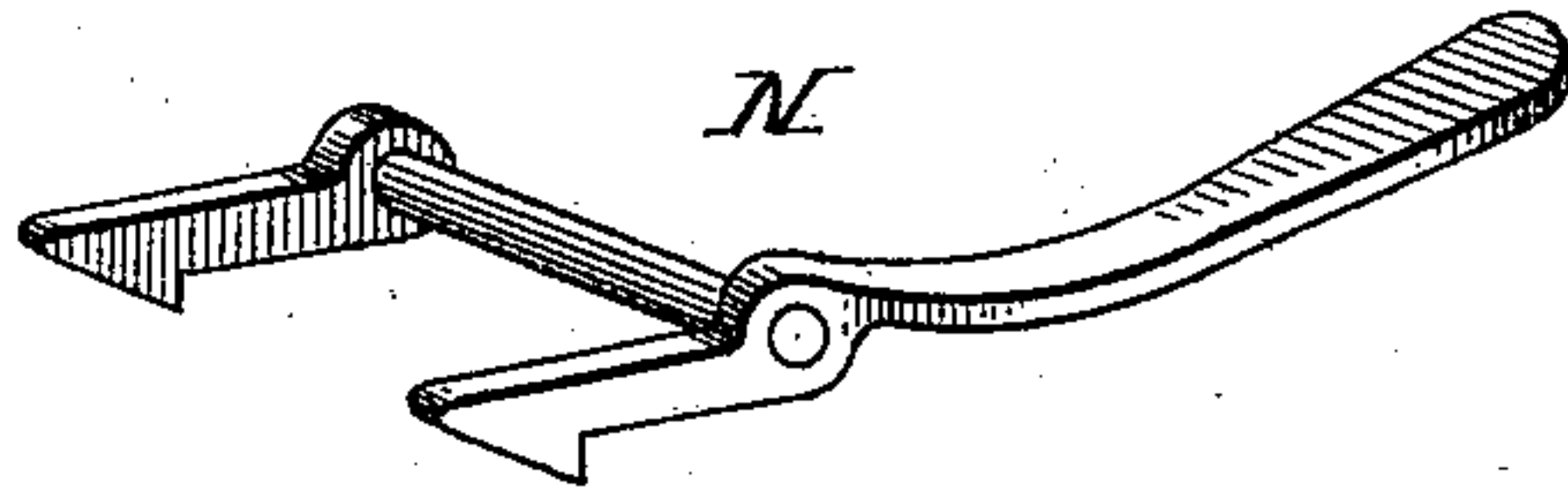
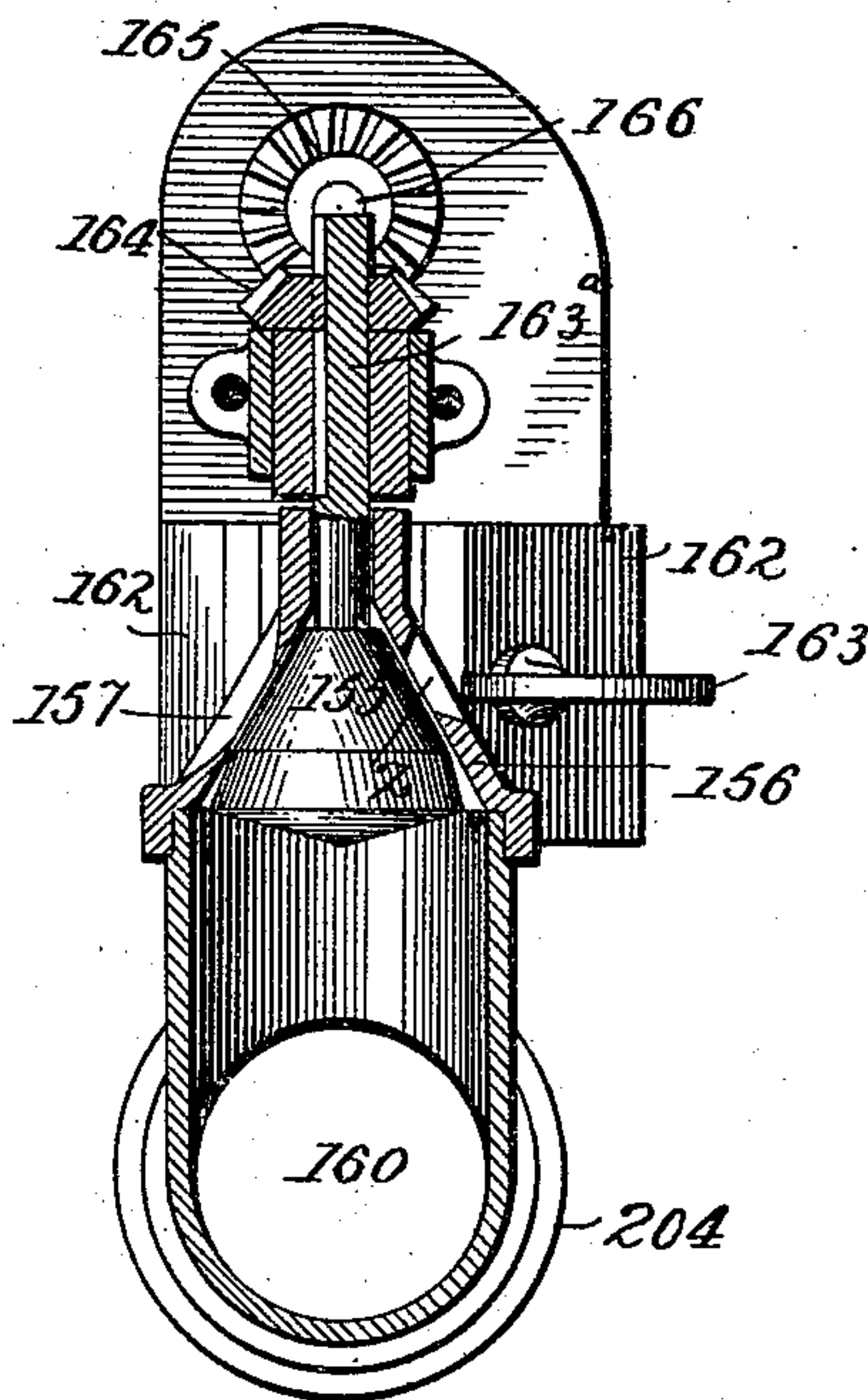


Fig. 27.



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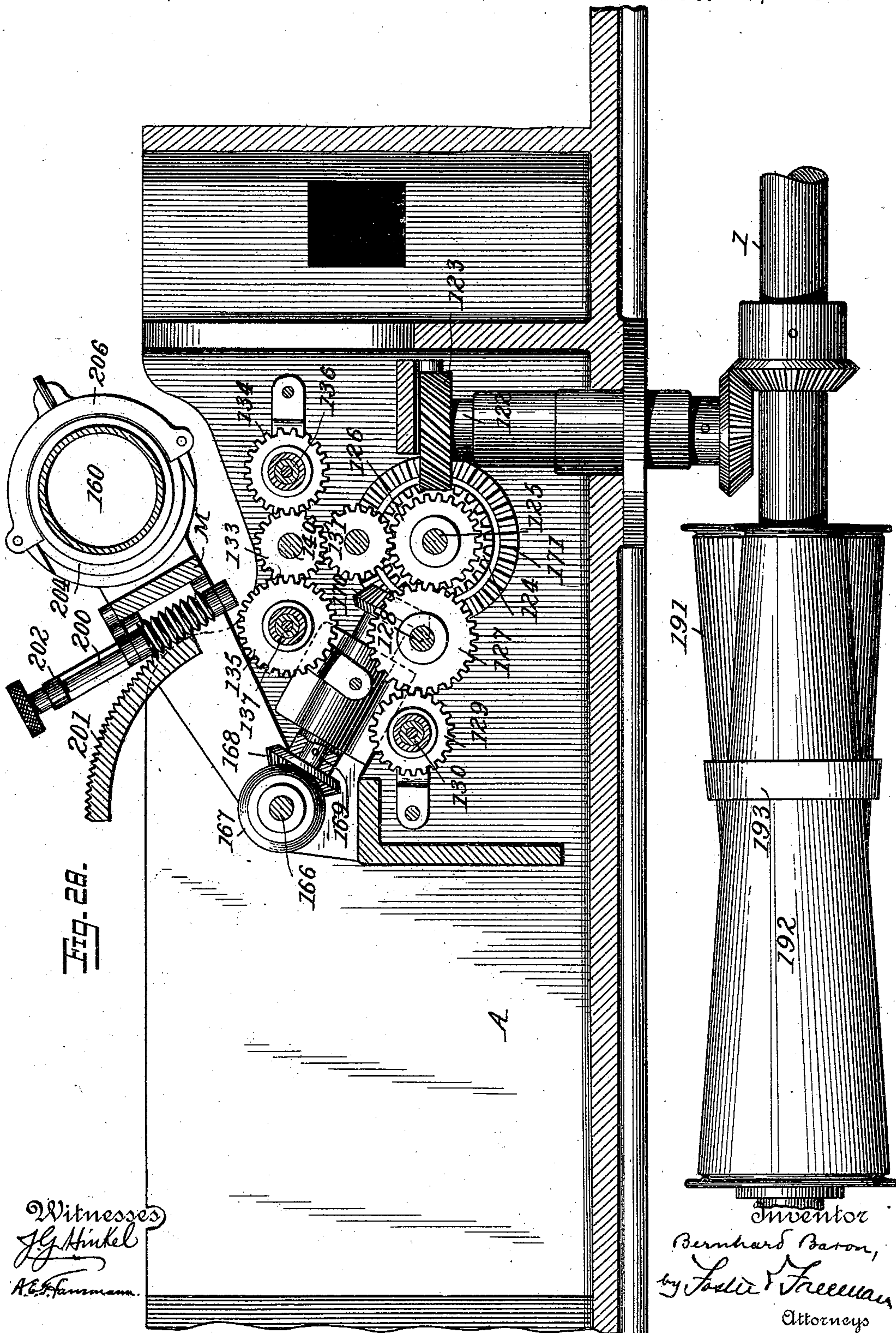
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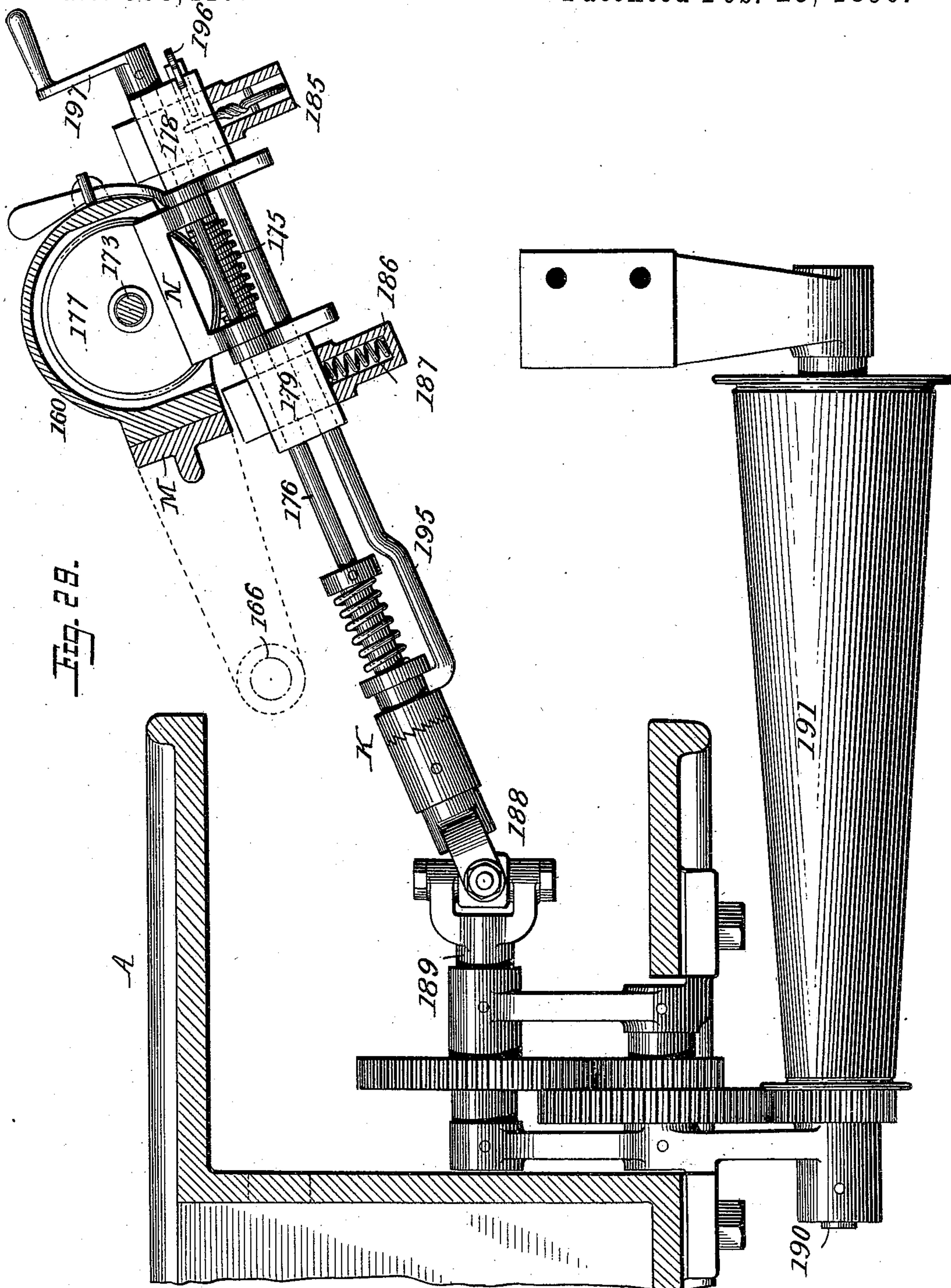
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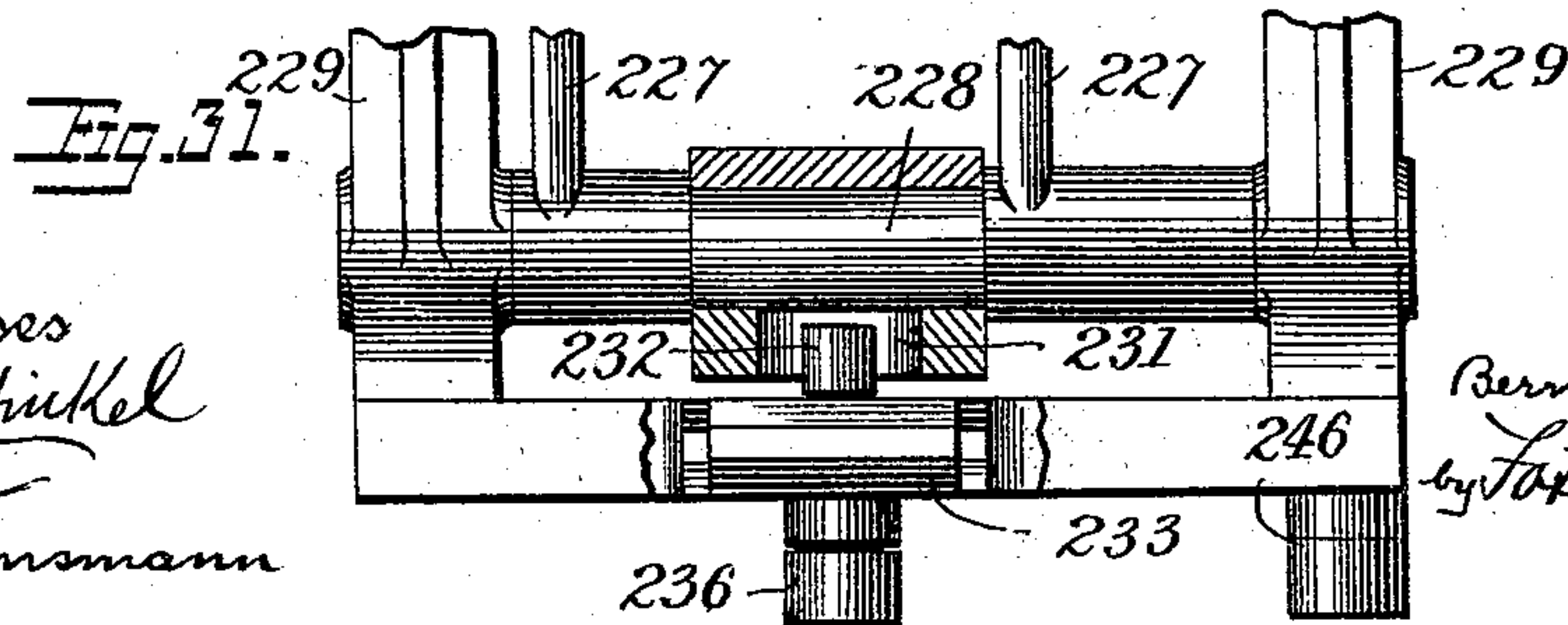
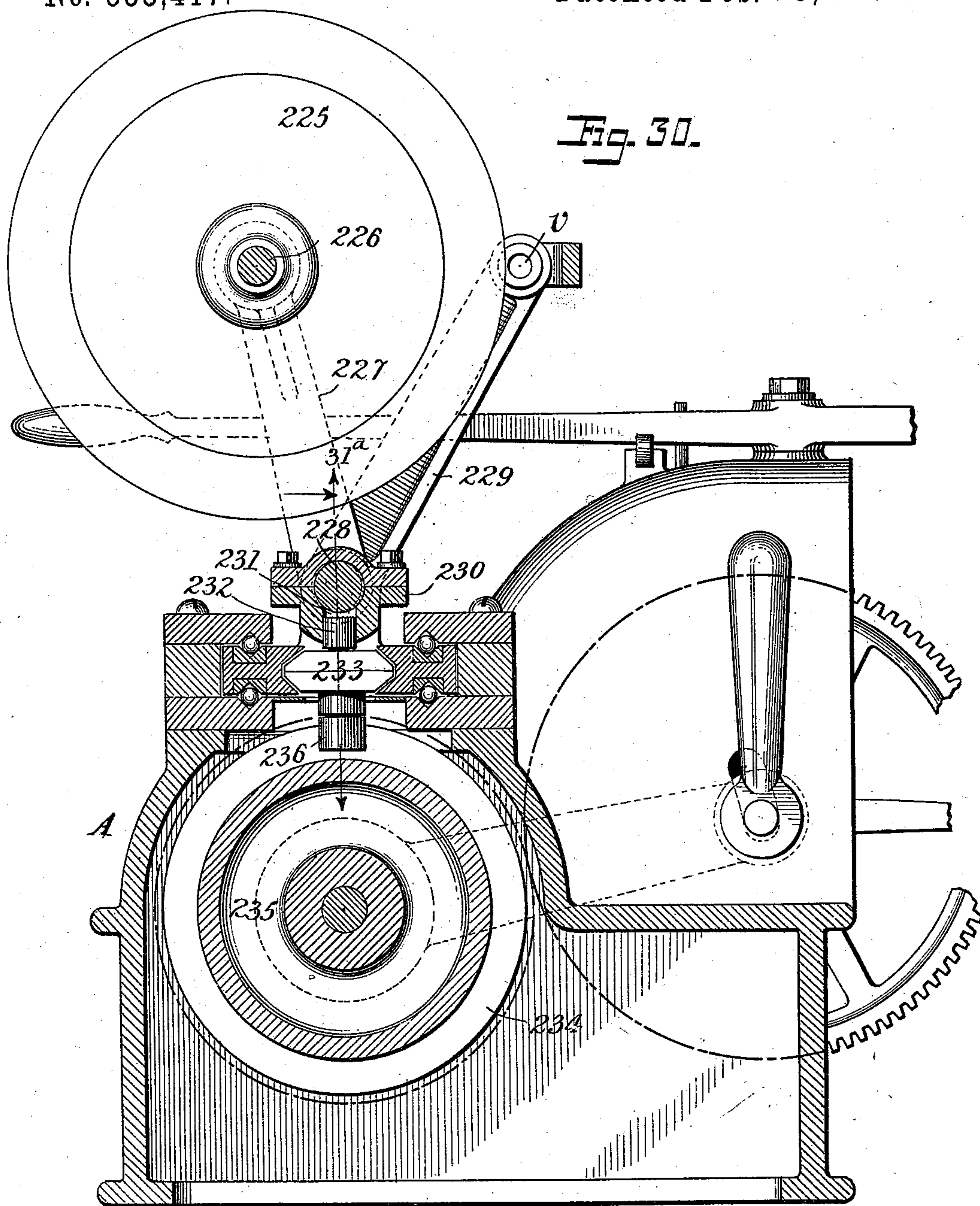
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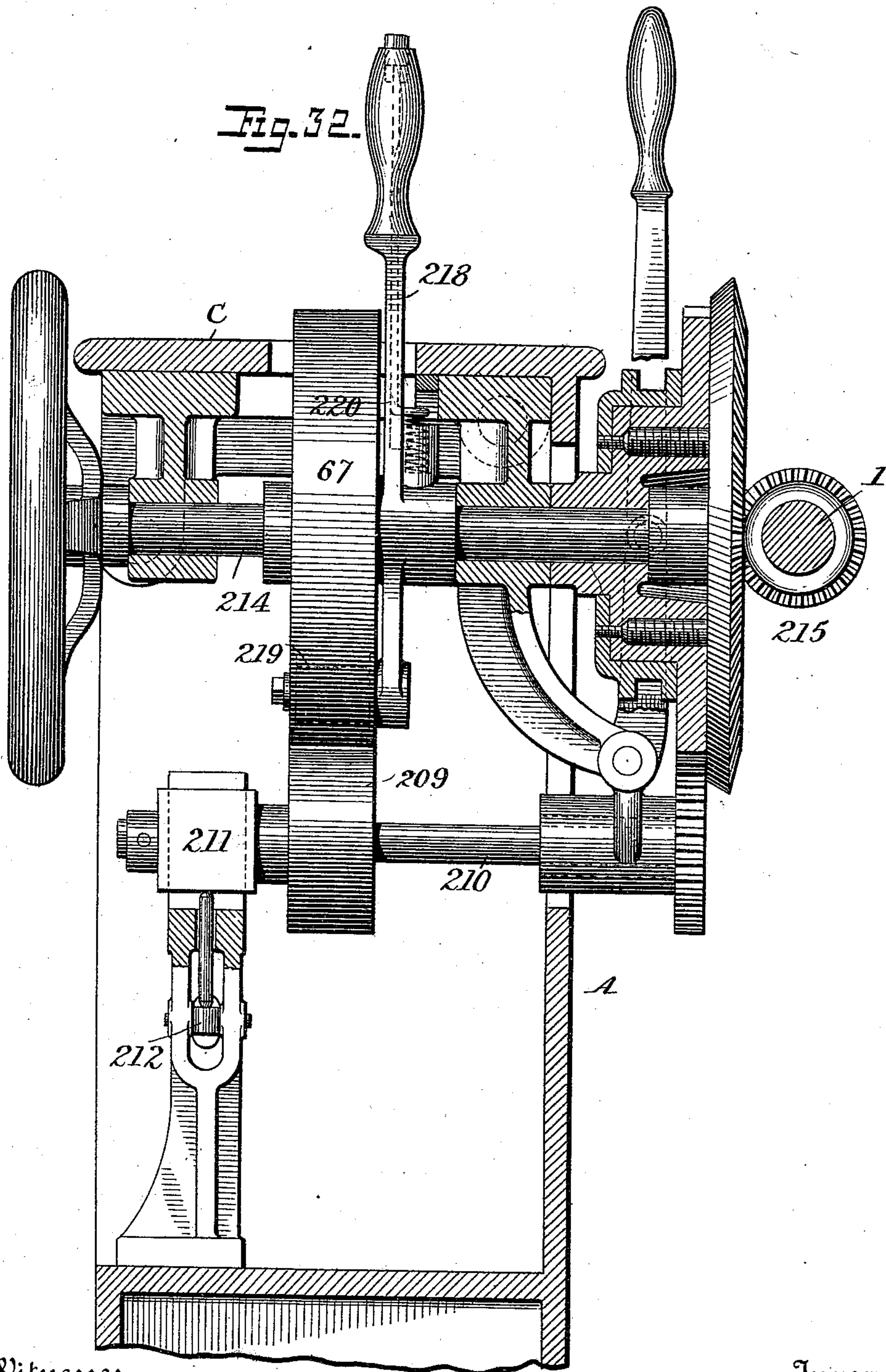
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(No Model.)

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Fig. 33.

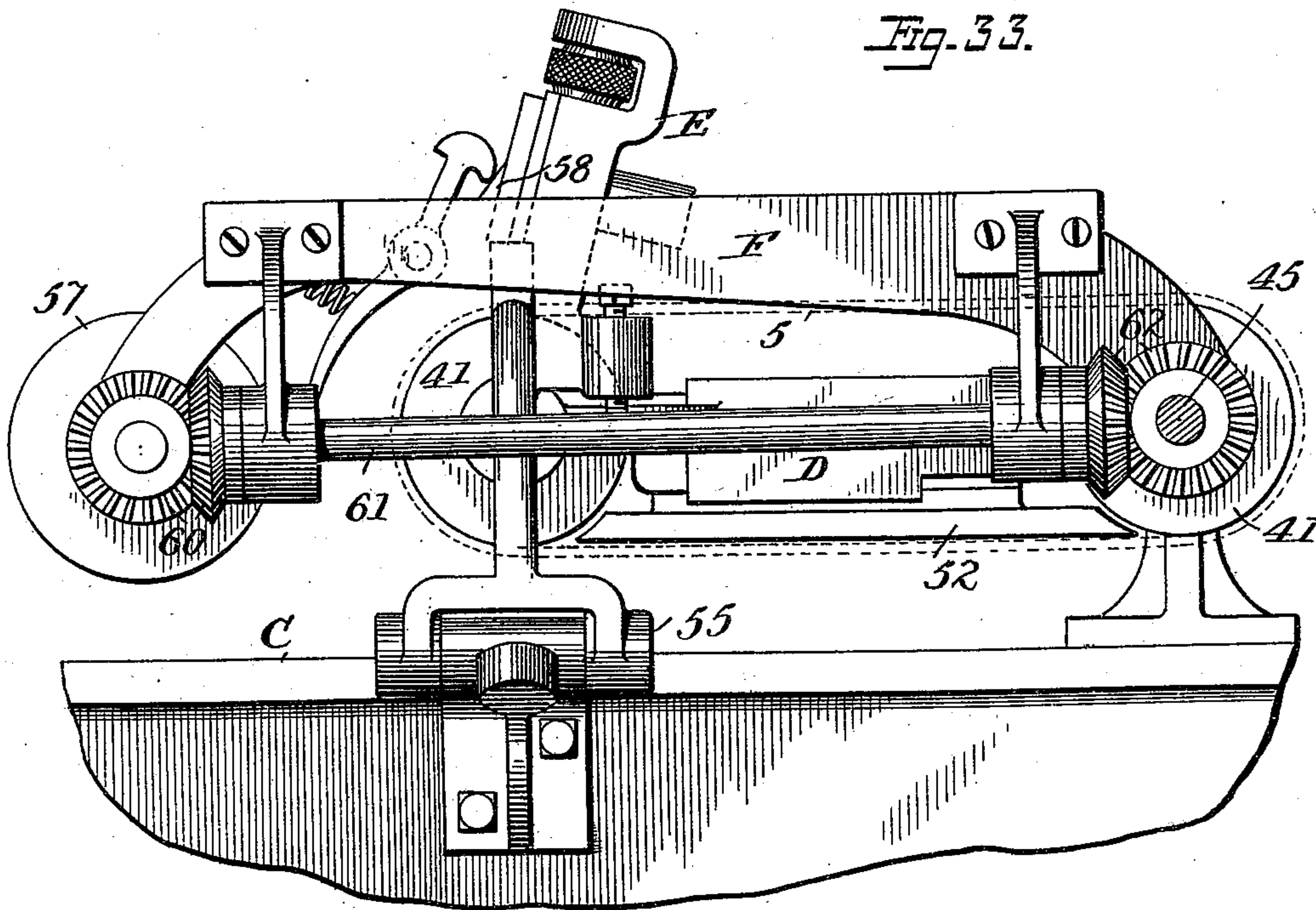
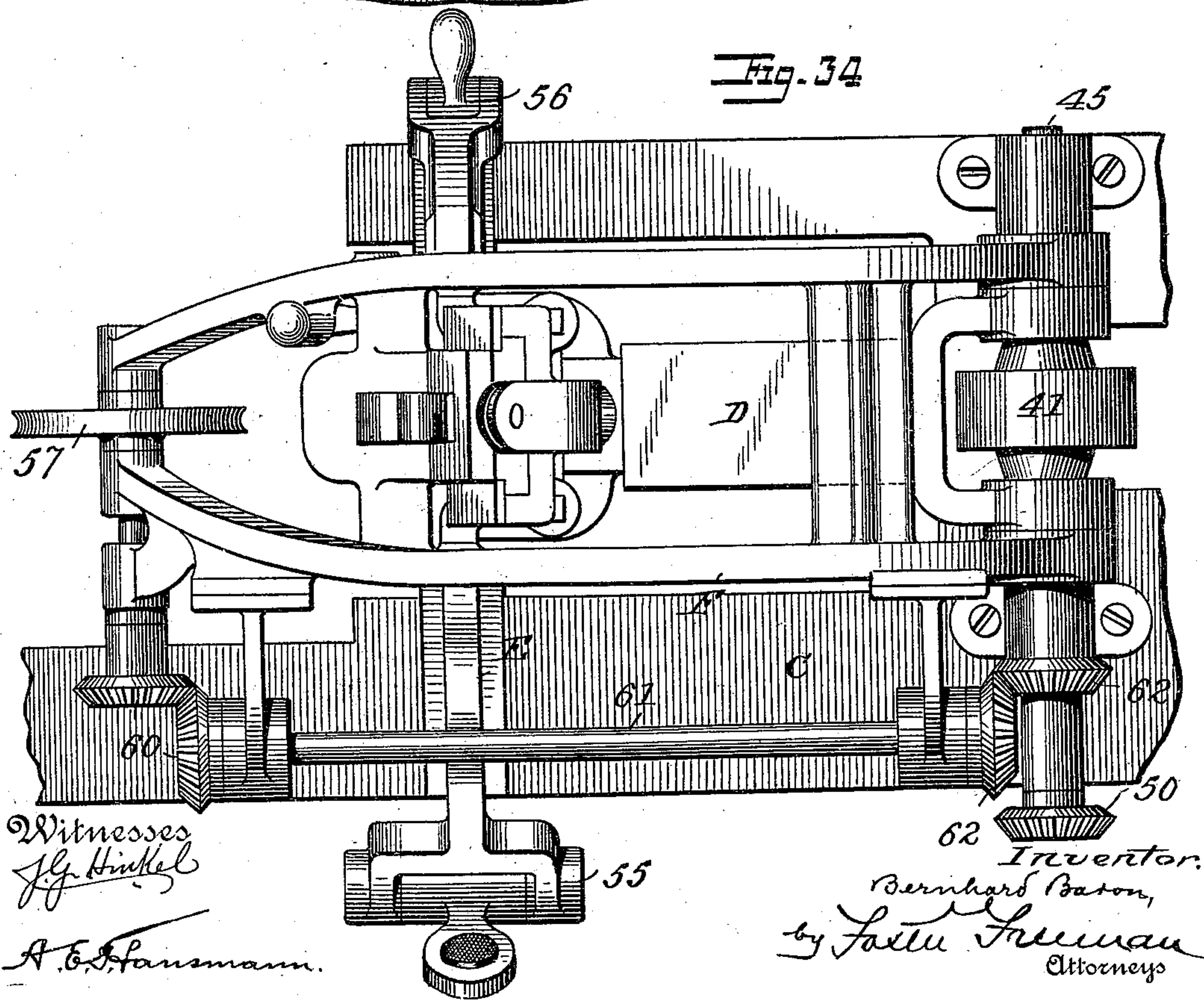


Fig. 34



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# UNITED STATES PATENT OFFICE.

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## CONTINUOUS-CIGARETTE MACHINE.

SPECIFICATION forming part of Letters Patent No. 555,417, dated February 25, 1896.

Application filed May 29, 1894. Serial No. 512,874. (No model.)

*To all whom it may concern:*

Be it known that I, BERNHARD BARON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Continuous-Cigarette Machines, of which the following is a specification.

My invention relates to the manufacture of cigarettes; and my invention consists in means for forming the loose tobacco into a rod, for applying the wrapper thereto and pasting the edges of the wrapper together, and for cutting the continuous cigarette into suitable lengths, all as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a cigarette-machine embodying my improvements. Fig. 2 is an enlarged sectional view longitudinally through the machine at one side of the operating devices. Fig. 3 is an enlarged view of the molding devices and adjuncts, the parts above the compressing or molding disks being removed. Fig. 4 is a sectional plan showing the parts directly below the molding-disks or compressors. Fig. 5 is a section on the line 5<sup>a</sup>, Fig. 3. Fig. 6 is a plan of the wrapping-trough, showing the folding-disks and pasting-wheel in dotted lines. Fig. 7 is a side elevation of the wrapping-trough. Figs. 8 to 13 are cross-sections on the lines 8 13, Fig. 7. Fig. 14 is an enlarged plan of the folding and pasting devices. Fig. 15 is a sectional elevation on the line 15<sup>a</sup>, Fig. 3. Fig. 16 is a transverse section on the line 16<sup>a</sup>, Fig. 15. Fig. 17 is a transverse section on the line 17<sup>a</sup>, Fig. 15. Fig. 18, Sheet 5, is a plan of the wrapping-trough with the parts above all removed. Fig. 19 is an enlarged cross-section on the line 19<sup>a</sup>, Fig. 2. Fig. 20 is a perspective view of the link connections between the compressing-roll bearings. Fig. 21 is an enlarged cross-section on the line 21<sup>a</sup>, Fig. 2. Fig. 22 is a sectional elevation on the line 22<sup>a</sup>, Fig. 14. Fig. 23 is an elevation looking in the direction of the arrow 23<sup>a</sup>, Fig. 14. Fig. 24 is an enlarged sectional elevation of the paste-reservoir and paste-feeding appliances. Fig. 24<sup>a</sup> is a cross-section on the line 24<sup>b</sup>, Fig. 24. Fig. 25 is a vertical section on the line 25<sup>a</sup>, Fig. 24. Fig. 26 is a perspective

view of a catch device. Fig. 27 is a cross-section on the line 27<sup>a</sup>, Fig. 24. Fig. 28 is an enlarged sectional plan on the line 28<sup>a</sup>, Fig. 2. Fig. 29 is an enlarged sectional plan on the line 29<sup>a</sup>, Fig. 1. Fig. 30 is an enlarged transverse section on the line 30<sup>a</sup>, Fig. 2. Fig. 31 is a transverse section on the line 31<sup>a</sup>, Fig. 30. Fig. 32 is an enlarged transverse section on the line 32<sup>a</sup>, Fig. 2. Fig. 33 is an enlarged side elevation showing the parts above the compressing-disks. Fig. 34 is a plan of the parts shown in Fig. 33. Fig. 35, Sheet 2, is a perspective view illustrating the devices for supporting the compressing-blade above the wrapping-trough. Fig. 36 is a vertical section illustrating the bearings for the folder-wheels.

The frame A carries the parts that operate upon the tobacco, which is properly distributed upon a traveling belt 6, Figs. 1 and 2, by the action of a feeder device B, also carried by the frame A.

The tobacco upon the belt 6 passes between grooved molding-disks, of which there may be one or more pairs. As shown, it passes first between the edges of two horizontal grooved molding or compressing wheels or disks 3 3, between guide-blocks 7 7, and between the edges of horizontal grooved molding or compressing wheels or disks 4 4, and is thence carried onto a strip of paper *x* carried by a tape 40. The tape and the paper are turned up to a U shape, one edge of the paper is turned in, the inner face of the standing edge has paste applied to it, the said standing edge is then turned down upon the inturned edge and cemented thereto, forming a wrapper-tube inclosing a tobacco rod, and this inclosed rod then passes to the cutting devices which sever the continuous cigarette into cigarettes.

I do not here describe the construction and operation of the feeder which constitutes the subject of a separate application for Letters Patent, filed November 17, 1893, Serial No. 491,215.

*The molder.*—The feeder distributes the tobacco loosely upon the face of the traveling belt 6, and between two guide-bars 400 400, and as the tobacco is carried between the edges of the wheels or disks 3 3 the tobacco is compressed laterally and is confined between the wheels or disks, the horizontal portion of the



belt 6 which passes below the wheels, and an upper endless belt 5, the lower horizontal portion of which lies close upon the tops of the wheels or disks, being carried by two rolls 41 41. The peripheral grooves in the disks 3 3 are greater in depth than those in the disks 4 4, and the intermediate blocks 7 7 have their curved sides seated in said grooves so closely that the tobacco cannot pass between the blocks and disks. These blocks 7 7 are preferably free from positive engagement with the adjacent portion of the bed-plate or frame of the machine, and merely rest loosely thereon, and are held in position by engagement with the peripheral grooves of the disks 3 4, each block being loosely clamped in place between the disks by a screw 9, Figs. 3 and 21, passing horizontally through a bearing-block 8, engaging the disks at the opposite side. It follows from this construction that the blocks are at all times free to accommodate themselves to the position of the disks, and that as the latter are adjusted from time to time, as occasion may require, the blocks are moved at the same time, owing to their engagement with the disks, and thus all danger of the blocks binding against the disks, liable to occur where the blocks are positively secured to stationary supports between the disks, is avoided. The disks of each pair are adjustable to and from each other through the medium of any suitable devices. As shown, the shafts 26 of the disks 3 3 pass through elongated bearings 26<sup>a</sup> in frames 10 10, Figs. 4 and 19, each frame 10 being pivoted to swing around the bearing of one of the shafts 27 of one of the disks 4, and the two frames 10 10 are connected by two toggle-links 12 14 pivoted together, an arm 12<sup>a</sup> of the link 12, Figs. 4 and 19, terminating in a finger 13 that extends into a groove 16 (see dotted lines, Fig. 4) in a nut 15 turning on a stationary screw-shaft 17 below the bed-plate or table C of the machine. By turning the nut 15 the links may be adjusted to swing the frames 10 10 to or from each other, and each frame 10 may be secured in position after adjustment by a binding-screw 11 passing through a slot in the said frame.

The shafts 27 of the disks 4 are carried in elongated bearings 27<sup>a</sup>, Fig. 21, of slides 25, sliding laterally between guides 30 30, and each with a slot through which passes a set-screw 38.

The slides 25 and their disks are adjusted to and from each other by means of a flat lever 170, (see dotted lines, Fig. 4, and full lines, Fig. 21,) pivoted to the table by a pivot 22 and having two inclined slots 23, each of which receives a stud 24 projecting from the bottom of one of the slides 25. At the end of the lever 170 is an arm 18, Fig. 21, having a lip 19, that enters a groove 21 in a nut 20 upon the screw-shaft 17, so that by adjusting said nut the lever may be swung to carry the slides and their disks to and from each other.

The molding and compressing wheels or

disks are all driven from the main shaft 1, Fig. 19, through the medium of an inclined shaft 41 geared to the shaft 1 and to a beveled wheel 38 at the lower end of a short shaft 43, Figs. 2 and 19, carrying at the upper end a gear 37. The gear 37 engages a gear 36 at the lower end of one of the shafts 27, and the latter also carries a gear 35, which drives a gear 31 upon one of the shafts 26 through the medium of the gear 34. A gear 33, Fig. 19, engages the gear 37 and transmits motion to another gear 32, which drives the lower gear 36 of the other shaft 27, and the latter drives the adjacent shaft 26 through the medium of gears 35 31, the same as shown in Fig. 2 on the opposite side.

In order to set the machine properly and to get access to the parts from time to time, I support the upper endless belt 5 upon a movable frame D, which may be of any suitable character. This frame swings about the shaft 45, extending transversely across the table and driven by two pairs of gears 48 50 and an inclined shaft, Fig. 1, from the shaft 1. The rear roller 41 is secured to the shaft 45, Fig. 2, and the front roller 41 is adjustable to and from the rear roller so as to tighten the belt 5. Any suitable appliances may be employed for this adjustment.

The frame D carries a plate 52, which lies directly above the lower horizontal portion of the belt 5 to prevent the latter from curving upward under pressure of the tobacco, and I have found it to be important to press the traveling belts firmly against the molding wheels or disks, and I therefore carry the lower or feed belt over the flat top of a portion of the table or platform, and I lock the frame D so as to hold the upper plate 52 firmly in position. Any suitable means may be employed for locking the frame D in its lower position. As shown I make use of a locking-frame E, Fig. 21, which swings upon a pivot 55 at one side of the machine, carries set-screws 250 250, that bear upon the forward end of the frame D, as shown in Figs. 2 and 21, and is secured by a spring-catch 56. By unlocking the catch 56 and turning the frame E back to the position shown in dotted lines, Fig. 21, the frame D is released and can then be swung to the position shown in dotted lines, Fig. 2, to permit access to the working parts of the molding device.

It is desirable in some instances to exert a pressure upon the tobacco after it leaves the molding wheels or disks, and I therefore support in rear of the said wheels a vertical grooved wheel 57, which turns at the outer end of a frame F, also pivoted to the shaft 45 and capable of being turned down to the position shown in full lines, Figs. 1 and 2, or swung back to the position shown in dotted lines, Fig. 1.

When the frame F is down in the position shown in Fig. 2, it is locked to the locking-frame E by any suitable locking device—as, for instance, by means of a catch 58, Fig. 2—



so that the frame and its wheel 57 are held positively in position. The wheel 57 may rotate freely, but I prefer to drive it positively, and for this purpose a shaft 61, carried by the frame F, is geared by a pair of beveled gears 60 with the shaft of the wheel 57, and by a pair of beveled gears 62 with the shaft 45, Figs. 33 and 34.

It will be seen that the edges of the guide-blocks 77 between the molding-disks diverge slightly from the forward or feed end of the machine, which prevents the binding of the tobacco, permitting it to expand slightly as it is carried onward.

The lower belt 6, which serves both as a part of the molding device and as a carrying or feed belt leading from the feeder B, passes at the front around a driving-wheel 63 (dotted lines, Fig. 1) upon a shaft driven from the shaft 1 through the medium of gears 64, and at the rear around a carrier-wheel 65, the upper portion of the belt between said wheels being preferably supported against sagging by a stationary part of the machine, all as best shown in Figs. 2 and 15.

*The folder.*—Close to the carrier-wheel 65 is a guide wheel or roller 66, around which pass the tape 40 and the paper strip  $\alpha$  carried thereby. The tape 40 passes at the rear to a driving-wheel 67, Figs. 2 and 32, and over a sliding table or platform G, (best shown in Figs. 2, 14, 15, and 16,) which table carries the forward roll 66, and which, together with the parts supported thereby, may be moved back and forth to carry the roll 66 to and from the roll 65. Any suitable means may be employed for imparting movement to the table G. As shown, Fig. 14, the table carries a shaft 90, provided with a handle 91 and with a pinion 92, which engages a stationary rack 93 upon the main frame.

A bridge-plate 94, Figs. 4 and 15, extends between the rollers 66 65, so as to support the sliver or rod of tobacco as it passes from the belt 6 onto the strip of paper  $\alpha$  carried by the tape 40. This bridge 94 is detachable, being slotted to receive two pins 95 upon a frame 70, as described hereinafter. The movable table G carries the bridge 94 and wrapping devices and the parts which support the tape 40 and the paper strip  $\alpha$ , and is movable, as set forth, to permit the table and the wrapping devices carried thereby to be carried from the molding devices when ready access to the parts is required.

It is desirable to shift the lateral position of the roller 66 which supports the tape 40, and also to independently shift the lateral position of the strip of paper  $\alpha$ , and I therefore combine with the frame or other support means for independently shifting both the paper strip and tape 40. Various devices may be employed for this purpose. As shown, I make use of two movable frames 68 and 70, Figs. 3, 4, 15, 16, and 17. The frame 68 has a bracket 69 that supports a guide 100, through which the tape 40 passes to the roller

66, and the frame 70 may be shifted laterally by turning a screw-shaft 101 having a milled head 103 and extending through a rib 102 bolted to the table G. The frame 70 is provided with arms 71 carrying between them the roll 66, and this frame 70 may be shifted laterally by means of a threaded shaft 76, extending through the rib 102 and provided with a milled head 75. By turning the heads 75 and 103 the guide 100 and the roller 66 may be shifted independently to any extent necessary to shift the lateral position of either the paper strip or the tape 40.

The sliver or rod of tobacco just prior to leaving the belt 6 passes between the ends of two converging plates 81 81, Figs. 3 and 16, which form flanges upon two caps or covers 80, each hinged at 82 to the platform or table, and capable of being turned up, as indicated in dotted lines, Fig. 15, to permit access to the parts beneath, and each cover carries a set-screw or binding-screw 104, which when the cover is down may be turned to bind firmly against the side of the rib 102 and hold the cover in place.

Just back of the roller 66 is arranged a paper-former 106, Fig. 4, which is a plate flat at the end nearest the roller 66, and then bent up each side to form a U-shaped rear end adjacent to the point where the paper passes from beneath the covers 80, the flanges 81 of which extend down between the upturned edges of the former, as shown in cross-section, Fig. 5. As the tape and paper pass through the former 106, they are bent up at the sides, forming standing edges which receive between them the sliver or rod of tobacco.

Owing to the speed at which the machine is driven, the tobacco will not have time to expand materially between the point where it leaves the disks 4 4 and the point where the tape and paper are turned up to their full extent, so that under the ordinary operations of the machine at its regular speed the tobacco will not be brought in contact with the converging plates or flanges 81, which, however, in case of stoppage prevent the tobacco from swelling beyond the edges of the tape.

In order to keep the compressing-disks 4 4 free from adhering tobacco or from gummy matter which may exude from the latter in the operation of the machine, I provide scrapers of any suitable character, arranged to act against the disks. As preferred and shown, Figs. 3 and 15, the converging plates or flanges 81 81 are prolonged at their forward ends to form scrapers 81 $\times$  81 $\times$ , which engage the peripheries of the disks 4 4 and remove therefrom any particles of tobacco or other matter which may adhere thereto. The ends of the scrapers are rounded off to fit nicely into the concave edges of the disks, and, of course, if disks of a different form are used, the scrapers will be shaped accordingly. As the scrapers are preferably carried by or formed on the free ends of the plates or flanges 81, they may be readily swung up to



the position shown in dotted lines, Fig. 15, away from the disks, if for any reason it is desirable to remove the disks or to get free access to them or to the adjacent parts below the hinged covers 80.

After leaving the paper-former, the traveling U-shaped tape and paper strip, with the rod of tobacco, pass into the "wrapping device" I, Fig. 14, which is suitably constructed to turn down first one edge of the paper strip and then the other, first pasting the latter edge.

Prior to any operation upon either edge of the paper, the tobacco rod is carried beneath the grooved edge of the wheel 57, which tends to hold the tobacco rod in its compressed state and prevents it from expanding, and also to prevent fibers of the tobacco from springing up and interfering with the wrapping and pasting operations.

After leaving the wheel 57, the standing edge of the paper is brought at one side against the curved edge of a folding-disk 108, Figs. 6, 10, and 14, which turns down that side of the paper onto the tobacco rod, after which a paster-wheel 109 applies a line of paste to the inner face of the opposite standing edge of the paper, Figs. 6 and 11, after which the latter standing edge is bent over onto the infolded side and pressed against the same to cement the two together by a curved-edged folding-disk 110. These disks co-operate with a trough J in the form of a bar having a half-round groove *y*, which is slightly wider in diameter at the receiving end.

An overhanging arm 120 projects from a piece which is bolted to the upper face of the trough J, and which projects toward a rib 112, bolted to the said trough on the opposite side of the groove *y*, with sufficient space between the two for the standing edges of the paper and belt.

In order to reduce the friction of the parts against the arm 120, and keep the tobacco rod in its compressed state, I make use of the folding-disk 108, curved at the periphery, as shown in Fig. 10, and extending nearly to the rib 112, the curved edge of the disk, which is driven at the same speed as the traveling tape and paper, bearing upon the inturned edges of the paper and tape and holding them down beyond the arm 120.

In some cases, where the tobacco is extremely elastic, additional means may be employed for holding it in its compressed position, in which case I make use of a blade 113, Figs. 6, 9, and 35, suspended above the groove *y* and extending from a point adjacent to the wheel 57 to a point below the curved edge of the folding-disk 108, there being sufficient space between the blade 113 and the arm 120, which overhangs it, to permit the paper and tape to be turned down at one edge over the blade, so that the inner face of the latter bears directly upon the tobacco. With this blade are connected devices of any suitable character for supporting it, so that its

vertical and lateral position can be changed if desired. Thus a screw 114 extends through a bracket laterally and into an arm 115, connected to the blade, and serves to change its lateral position while the screw 116 serves to raise or lower the same.

The paster-wheel 109 is arranged beyond the folding-disk 108, with an intervening overhanging block 117, that tends to hold the inturned edge of the paper close upon the tobacco rod as the standing edge is brought opposite the paster-wheel, the block 117 extending beneath the paster-wheel so as to prevent any paste on the under side of the latter from being brought upon the inturned edge of the paper. After leaving the paster-wheel the standing edge of the paper is brought against the curved edge of the folding-disk 110, which folds said standing edge over onto the inturned edge and presses the pasted edge onto that beneath it, after which the paper with the inclosed tobacco rod is carried beneath an overhanging block 121, with under curved face and a curved end that turns the edge of the tape away from the wrapper, and which holds the parts in place until the paste is fully set, the sealed tube of paper with the inclosed rod of tobacco then passing onward toward the cutter.

The folding-disks 108 and 110 and the paster-wheel 109 are driven positively, and to this end the shafts of the disks extend to the platform or table G, and carry at their lower ends the connecting-gears. (Best shown in Figs. 22, 23 and 28.) In said figures a shaft 122, driven by gears from the shaft 1, carries a worm-wheel 123, meshing with another worm-wheel 124 on a shaft 125, and a pinion 126 on the latter shaft drives a pinion 127 on a fixed shaft or stud 128, and the pinion 127 drives the pinion 129 upon the shaft 130 of the disk 110.

A pinion 131 transmits motion from the pinion 126 to a pinion 133 on a fixed stud or shaft 140, and the pinion 133 drives the pinions 134 and 135 upon the shafts 136 and 137 of the folding-disk 108 and paster-wheel 109. Thus all the shafts of the paster-wheel and adjacent folding-disks are driven from the shaft 1, and the gears are so proportioned that the speed of the paper-wheel and folding-disks is the same as the speed of the molding or compressing disks.

It is essential to adjust the paster-wheel and folding-disks to and from the edges of the paper upon which they act, and I therefore form the bearings of this wheel and disks in swinging frames with which are combined adjusting devices. Thus a frame 138, pivoted to the stud 128, carries the bearings of the shaft 130, while frames 141 and 142, pivoted to the stud 140, carry the shafts 136 and 137 of the disk 108 and paster-wheel 109. Each frame is connected with a screw-rod 150, having a milled head and passing through a stationary nut 151, so that by turning the rod the frame can be carried in and out. It



is also desirable to adjust the disks and other wheels vertically, which may be done by means of any suitable devices. Thus with the shaft of each wheel or disk are combined the parts illustrated in Fig. 36, showing the arrangement in connection with the shaft 136. This shaft is a hollow shaft fitting an opening in the frame 141, which carries the gear 134, from which the shaft may be withdrawn, thus permitting the shaft and wheel to be removed from the bearings and driving-gear. The shaft 136 is hollow and rests upon a nut 145, which can slide without turning in an opening in the frame, and into which extends the lower threaded end of a screw-rod 146, having a milled upper end extending above the disk or wheel, so that it may be turned to raise or lower the nut and with it the tubular shaft.

As shown in Fig. 28, the worm-pinion 123 is on the end of the shaft 122, so that the sliding table G with its worm-pinion 124 can be moved back and forth to and from the shaft 122.

*The paster.*—The paster-wheel 109 takes the paste on its periphery from the face of a cone 155, which turns in a conical case 156, having at one end hooked fingers 158 for engaging lugs 159 on the inturned end of the neck of a paste-reservoir 160, said lugs having inclined edges to insure the binding of the parts together, so that the reservoir can be brought to a horizontal position to introduce the lugs between the hooks 156 and can then be turned to a vertical position, as shown in Figs. 24 and 25, to connect the reservoir to the conical casing 156, which latter is secured to a bracket 161 that is movable back and forth between the guides 162 162 and can be secured in position by a set-screw 163.

Any suitable means may be employed for positively driving the cone 155 at any desired speed to regulate the feed of paste to the paster-wheel. As shown, a shaft 163<sup>a</sup> of the cone passes through a bearing and through a beveled gear 164, so as to slide in and turn with the latter, and the beveled gear engages with the bevel-gear 165 on a vertical shaft 166, having at its lower end a bevel-wheel 167 that gears with another bevel-wheel 168 on a shaft 169, carrying a bevel-wheel 170 driven by a bevel-wheel 171 on a shaft 125.

It is desirable to relieve the cone of surplus paste, and I therefore provide the casing 156 on the side opposite the slot 157 with an opening *z*, through which any surplus portion of paste upon the face of the cone can pass so that the film upon the said face will always be uniform. To regulate the depth of this film the cone is adjustable in the case, which adjustment may be effected by any suitable devices. Thus a lever 170<sup>a</sup>, which may be swung to different positions by a set-screw 171<sup>a</sup>, bears with one end against the end of the shaft 163<sup>a</sup> to set the shaft and its cone to any desired position by pressing them inward, the pressure of the paste tending to force them

outward. The paste is forced upward by a piston 172 upon a rotating piston-rod 173, which is threaded and passes through a two-part nut 180 181 and through the hub of a worm-wheel 177, the turning of which turns the piston-rod and moves the piston up or down. The two parts of the nut may be separated, when the rod and its piston may be moved directly up or down. The separation and bringing together of the parts of the nut are effected by cams 182 183 on a handled shaft 184. Any suitable means may be employed for turning the nut to feed the piston-rod, but, as shown, I make use of a worm 175 on a shaft 176, which worm meshes with the worm-wheel 177. The shaft 176 turns in bearings 178 and 179 carried by brackets 185 and 186 below the bed-plate, the bearings fitting slots in these brackets, and a spring 187 forcing the shaft and its bearings toward the paste-reservoir, and in order that the feeding may be arrested at any time the shaft 176 is provided with a coupling or clutch K, connecting the shaft 176 by a universal joint 188 with a shaft 189 driven by gears, as best shown in Fig. 29, from a shaft 190 carrying a cone 191. The cone 191 is arranged opposite a reverse cone 192 upon the shaft 1, and a belt 193 may be shifted upon the two cones by a shifter 194, Fig. 1, so as to vary the speed at which the piston is driven upward into the reservoir.

It is very desirable to obtain access to the parts of the pasting device, and I therefore prefer to carry the same by an adjustable frame, so as to swing the same to and from the propelling-worm 175. Thus the reservoir and its attached parts are carried by a swinging bracket M, Figs. 28 and 29, having its center of vibration upon the axis of the shaft 166, so that the shifting of the bracket does not alter the position of the driving connections with the cone, and when the worm-wheel 177 is brought in contact with the worm 175 the yielding bearings 179 will permit the worm and worm-wheel to engage, whatever may be the positions of the parts. In order to hold the bracket end in place, it is provided with a double hook-catch N, the hooks of which engage the brackets 178 and 179, as shown in Figs. 25 and 26.

The two parts of the clutch K may be separated by means of a rod 195, Fig. 29, which can be moved longitudinally by an eccentric-lever 196, and the shaft 176 is provided with a handle 197, by means of which it may be turned to test the operation of the paster. The bracket M may be swung to and secured in any desired position by turning a worm-shaft 200, Fig. 28, the worm of which engages with a curved rack 201 secured to the table of the machine, and in order to permit the bracket to be quickly turned when nice adjustment is not required the worm-shaft is carried by a pivoted frame 202, Fig. 24, so that the worm may be swung into and out of engagement with the rack 201. An eccentric-



lever 203 serves to force the frame 202 inward to bring the worm-shaft and rack into engagement.

In order to permit the paste-reservoir 160 to be readily removed, it is formed in two sections, the lower section adapted to receive the piston 172, when the latter is in its lowest position and being secured to the bracket M, while the upper section is removed, and these sections have peripheral flanges 204 205 to receive a clamp 206, which serves to hold them together.

In order to insure positive movement of the tape 40, regardless of the tension upon the same, I clamp it to the driving-wheel 67 by means of a clamping-roller 209, Figs. 2 and 32, on a shaft 210 having its bearings in a block 211, movable vertically and resting upon the short arm of a lever 212, that carries an adjustable weight 213.

The shaft 214 of the driving-wheel 67 is driven through the medium of gears 215 from the shaft 1, and a lever 218, swinging on the shaft 214, carries at one end a roller 219, over which the said tape 40 passes, so that the same can be slackened or loosened. The lever 218 carries any suitable catch device 220, by means of which it can be secured in any position to which it is set.

*The cutter.*—Any suitable cutting appliances may be used in connection with the above-described devices, but as these devices operate with great rapidity, and as it is desirable to avoid reciprocating the cutter too rapidly, I make use of two cutters. As shown, Figs. 2 and 30, these cutters consist of two disks 225 225, parallel to each other and arranged upon a shaft 226, carried by a vibrating frame 227. The frame 227 is secured to a rock-shaft 228, rocking in bearings on a frame 229, and to the said rock-shaft 228 is clamped a hub 230, having in it an inclined slot 231, so that the hub and the frame 227 are rocked by the reciprocating motion of a stud 232, carried by a slide 233, which in turn is reciprocated by the action of a cam-groove 234 in a cam-cylinder 235, into which groove extends a stud 236 from the slide 233. The rocking motion of the shaft and frame 227 is just sufficient to carry the sharp edges of the cutters 225 across the channel *v*, through which the continuous cigarette passes, the said channel being in a sectional tube 237, having a forward flaring end to receive the continuous cigarette, and the cutters are rotated at a high rate of speed, the shaft 226 being driven by a belt 239, passing to a small grooved pulley 240 on the cutter-shaft from a driving-pulley 241.

It is not only necessary to carry the cutters across the line of the cigarette-rod, but it is also necessary to carry the cutters longitudinally at the same speed at which the continuous cigarette moves, and I therefore carry the frame 229 with the continuous cigarette from the time the cutters begin to act until they are drawn back to their normal position, and

then return the frame prior to another cutting operation. This may be best effected by the action of the cam-groove 245 in the cam-cylinder 235, Fig. 2, which groove receives a stud 246, extending downward from the frame 229, which frame has a longitudinal bearing for the slide 233, and to reduce friction the base of the frame is grooved to receive roller-bearings that travel in grooves in the frame of the machine.

While I have referred to the revolving block or cone 155 of the paster as being of a conical shape, it will be evident that this revolving paste carrying and distributing block may be of different forms. It will also be evident that other means may be employed for imparting the longitudinal movement to the piston in connection with the other features described.

The rib 112, Fig. 11, is mainly employed as an abutment opposite the paster-wheel 109, so as to support the standing edge of the paper, if necessary, and prevent it from accidentally being broken down; but it will be evident that the folding-disk 110 (see Fig. 6) will tend to keep the standing edge of the paper in contact with the edge of the paste-wheel.

It will be seen that the folding-disks by which the paper is folded over above the trough are positively driven, and that by this means there can be no possible drag between the paper and the folding devices, as would be the case if they were stationary, and further that the said folding-disks actually aid in the onward movement of the paper and tobacco.

While I have referred to compressing-disks with grooved edges, in some cases they may be used with flat edges.

I am aware that a filler-forming mechanism comprising oppositely-arranged molding and compressing disks of like form, in combination with a belt extending over and closing the space between the edges of the disks at a point where they are nearest each other, a lower carrier belt or support for the tobacco, and means for positively driving said disks and belts, is not new, and I therefore make no claim herein to such a construction in itself.

I am also aware that a combination comprising an endless carrier-belt, a top or presser endless belt above the carrier-belt, grooved shaping-wheels mounted to revolve between these two belts, wrapper-feeding devices, a paper-former or mouthpiece adapted to receive the filler-rod and wrapper and partially curve the latter around the rod, and scrapers extending from the former or mouthpiece into the grooves of the adjoining shaping-wheels, to strip the filler-rod therefrom and guide it into the former or mouthpiece onto the wrapper, is old, and I likewise make no claim herein to such a combination in itself.

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim as my invention—



1. The combination with the compressing-disks having peripheral grooves, intermediate blocks having their edges fitted to said grooves, and means for clamping the blocks to said compressing-disks, of traveling belts respectively above and below the disks, substantially as set forth.

2. The combination with the compressing-disks having peripheral grooves, of intermediate blocks having their edges fitted to said grooves, and means for clamping the blocks to said compressing-disks, substantially as set forth.

3. The combination of the grooved compressing-disks, intermediate blocks 7, retaining-blocks 8, and horizontal screws 9, connecting said blocks and clamping them to the disks, substantially as set forth.

4. The combination with the adjustable compressing-disks having peripheral grooves, of intermediate blocks having their edges fitted to and supported in said grooves, and means for clamping said blocks to the disks, whereby the blocks are free to move with the disks, substantially as set forth.

5. The combination with oppositely-arranged compressing-disks, of adjustable bearings therefor, and means for simultaneously shifting said bearings to different positions to carry the disks to and from each other, substantially as set forth.

6. The combination with two pairs of oppositely-arranged compressing-disks, of adjustable bearings therefor, and means for simultaneously shifting said bearings to carry the disks of each pair to and from each other, substantially as described.

7. The combination of the pivoted frames, the oppositely-arranged compressing-disks carried thereby, and means for simultaneously adjusting said frames toward or from each other, substantially as set forth.

8. The combination of the frames 10, 10, pivoted at one end, oppositely-arranged compressing-disks carried by the frames, pivoted links connecting the opposite ends of the frames, and means for adjusting said links to simultaneously separate or move the frames toward each other, substantially as set forth.

9. The combination of the frames 10, 10, pivoted at one end, elongated bearings on the frames, oppositely-arranged compressing-disks mounted in said bearings, pivoted links 12, 14, connecting the opposite ends of the frames, one of said links terminating in an arm, a screw-shaft 17, and a grooved nut on said shaft engaging said arm, substantially as set forth.

10. The combination of the slides 25, 25, compressing-disks 4, 4, mounted thereon, a pivoted lever 170, and connections between the lever and slides whereby the slides are moved toward or from each other as the lever is swung upon its pivot, substantially as set forth.

11. The combination of the slides 25, 25, compressing-disks 4, 4, mounted thereon, the

pivoted lever 170, having inclined slots in its ends engaging studs on the slides, and means for moving the lever on its pivot to adjust the slides, substantially as set forth.

12. The combination of the slides 25, 25, shafts 27, 27, mounted thereon and carrying the compressing-disks 4, 4, frames 10, 10, pivoted at one end to said shafts, the compressing-disks 3, 3, mounted in bearings at the opposite ends of the frames, and means for adjusting the free ends of the frames toward or from each other, substantially as set forth.

13. The combination with the compressing-disks, of a swinging frame, an upper endless belt supported thereby, means for locking the frame in position with the belt pressed against the disks, and a lower support for the tobacco, substantially as set forth.

14. The combination with the compressing-disks, of a swinging frame, an upper endless belt supported thereby, means for locking the frame in position with the belt pressed upon the disks, and a belt below the disks, substantially as set forth.

15. The combination of the compressing-disks, the rollers supporting an endless belt above said disks in position to contact with the tobacco, and supported in a swinging frame, means for positively driving the belt and disks, and a lower support for the tobacco, substantially as set forth.

16. The combination with the pairs of oppositely-arranged compressing-disks, of a swinging frame, an endless belt supported thereby and extending over said pairs of disks, means for locking the frame in position with said belt pressed upon the disks, and a feed-belt below the disks, substantially as set forth.

17. The combination with the compressing-disks, a lower support for the tobacco, and a frame pivoted to a horizontal shaft above the disks and carrying an endless belt, of a second frame also pivoted to said shaft and carrying a compressor-wheel 57 at its free end, a support for the tobacco below said wheel, and means for positively driving said belt and wheel, substantially as set forth.

18. The combination with the compressing-disks, a belt below the disks, and a frame pivoted above the disks and carrying an endless belt, of a second frame also pivoted above the disks and carrying a compressor-wheel at its free end, a support for the tobacco below said wheel, and means for positively driving said disks, belts, and compressor-wheel, substantially as set forth.

19. The combination with the compressing-disks, a lower support for the tobacco, and a frame pivoted to a horizontal driven shaft above the disks and carrying an endless belt, of a second frame also pivoted to said shaft and carrying a grooved compressor-wheel 57, at its free end, a support for the tobacco below said wheel, and means for positively driving said belt and compressor-wheel from said shaft, substantially as set forth.

20. The combination with the paper-former



and a traveling tape passing therethrough, of laterally-movable frames 68 and 70, below the former, guides for the tape and wrapper-strip respectively mounted on said frames, and means for adjusting said frames independently of each other, substantially as set forth.

21. The combination with the paper-former and a traveling tape passing therethrough, of laterally-movable frames 68 and 70 below the former, a guide-roller 66 mounted on one of said frames, a guide 100 mounted on the other frame, and screw-shafts 76 and 101 for adjusting said frames independently, substantially as described.

22. In a cigarette-machine, the combination of the tobacco-rod-molding devices, the wrapping devices, and a table upon which the wrapping devices are assembled and which is movable toward and from the molding devices, substantially as described.

23. The combination of the trough and folding-disks, the bearings and driving-gears for the folding-disks, and shafts fitted removably to said bearings and gears, and supporting the folding-disks, substantially as described.

24. The combination with the trough and folding-disks, of the bearings and gears of said folding-disks, shafts fitted removably to said bearings and gears and supporting the disks, and means for adjusting the vertical height of the shafts, including rods 146 extending above the disks, substantially as and for the purpose set forth.

25. The combination of the trough, the traveling tape, the folding-disk 108 at one side of the trough, the pasting-disk, and the folding-disk 110 at the opposite side of the trough and arranged beyond the pasting-disk to fold down the paper and also to carry the standing edge of the paper away from the adjacent edge of the trough and toward the pasting-disk, substantially as set forth.

26. The combination of the paster-wheel, revolving paste-block for supplying paste to the edge of said wheel, a reservoir within which the said block revolves, a piston in said reservoir, and means for propelling said piston to expel the paste from the reservoir, substantially as set forth.

27. The combination with the paster-wheel, of a closed paste-reservoir having a delivery-slot at one side, a revolving block within the reservoir adjacent to said slot for delivering paste therethrough to the paster-wheel, and means for adjusting the reservoir to and from the paster-wheel, substantially as set forth.

28. The combination with the paster-wheel, of a reservoir having a funnel-like end with a delivery-slot in the side of said end, and a revolving cone within the reservoir in a position to deliver paste through said slot, substantially as and for the purpose described.

29. The combination with the paster-wheel, of a reservoir having a conical end, with a delivery-opening in said end at one side thereof, and a cone revolving in said end to deliver

paste through said opening, and a bracket supporting the said reservoir and swinging to and from the paster-wheel, substantially as set forth.

30. The combination of the closed paste-reservoir having a delivery-opening at one side, and the paste-delivery cone 155 in the reservoir adjacent to said opening, of a swinging bracket supporting the reservoir, and a shaft and gear for driving the said cone, the said shaft being in line with the axis of the reservoir, substantially as set forth.

31. The combination in a paste-delivery device, of a delivery-casing 156 having a delivery-opening at one side, and containing a revolving cone to deliver paste through said opening, and a reservoir connected detachably to said casing and provided with a feeding-piston, substantially as set forth.

32. The combination of the conical casing 156 having a delivery-opening at one side, the reservoir 160 having a bent end connected with the said casing, and formed in two sections, the lower section being secured immovably and the upper section being detachably connected with the lower section and containing a delivery-cone, and a piston adapted to enter the lower section, substantially as set forth.

33. The combination with the main frame of the machine, of the swinging bracket pivoted thereto and carrying the paste reservoir and feeder, of the rack 201 on said frame, and the swinging frame 202 on the bracket and carrying a worm adapted to engage with said rack, and the lever 203 for swinging the frame 202 toward the rack, substantially as set forth.

34. The combination with the paster-wheel, of a reservoir having a conical end with a delivery-opening at one side, and a revolving cone in said end, and means for adjusting the cone within the conical end, for the purpose set forth.

35. The combination of a driving-shaft, the paste feeding and delivery appliances, a bracket therefor adapted to swing to and from said shaft, and gears upon the shaft and carried by the bracket, arranged to mesh when the bracket is brought to the shaft to operate the paste-feeding devices, substantially as and for the purpose set forth.

36. The combination of the paste-reservoir, having a tapering casing with openings 157 and  $z$  at opposite sides thereof, a revolving conical feed-block in said casing, and a paster-wheel adjacent said opening 157, substantially as described.

37. The combination with the paste-wheel, of a paste-reservoir having a delivery end with a revolving block, and an opening at one side, the said reservoir being adjustable to and from the paste-wheel and in the direction of the axis of the block, substantially as described.

38. The combination with the paster-wheel, the paste-reservoir, and the piston therein, of



devices for moving the piston longitudinally, and means for varying the speed of motion of the piston, substantially as described.

39. The combination of the swinging  
5 bracket carrying the paste-reservoir and  
paste-supplying devices, the shaft 176, and  
gears for driving the paste-supplying devices  
from said shaft, and a clutch for throwing  
said shaft into and out of operation with the  
10 driving mechanism, substantially as de-  
scribed.

40. The combination of the swinging  
bracket carrying the paste-reservoir and  
paste-supplying devices, and a shaft 176, and  
15 gears for driving the said paste-supplying de-  
vices, said shaft being mounted upon yield-  
ing bearings and pivotally connected to a  
driving-shaft, substantially as set forth.

41. The combination with the compressing-  
20 disks and a lower support for the tobacco, of  
an upper belt, and a movable frame support-  
ing said belt and having a plate extending  
over and parallel to the disks above the belt,  
substantially as described.

25 42. The combination with the compressing-  
disks and a lower belt, of an upper belt, a  
movable frame supporting said upper belt  
and having a plate extending over and paral-  
lel to the disks above the upper belt, and  
30 locking means for the frame, substantially as  
described.

43. The combination with the compressing-  
disks and a lower support for the tobacco, of  
an upper belt, a swinging frame supporting

said belt and having a plate above the latter, 35  
and means for locking the frame in position  
with the belt pressed by said plate upon the  
disks, substantially as described.

44. The combination of the compressing-  
disks, the paper-former adjacent thereto, the 40  
converging plates 81, pivotally supported at  
one end above the former, and scrapers car-  
ried by said plates at their free ends in posi-  
tion to act against said disks, substantially  
as described.

45. The combination of the compressing-  
disks, the paper-former adjacent thereto, the 45  
plates 80 pivoted at one end above the former,  
and each having an edge flange or plate 81  
extending into the former, and scrapers at 50  
the free ends of said plates 81 in position to  
act against said disks, substantially as de-  
scribed.

46. The combination with the filler-forming  
mechanism consisting of compressing-disks, 55  
and belts respectively above and below the  
disks, of the paper-former, the converging  
plates 81 pivoted at one end above the former  
and extending into the latter, and scrapers  
at the free ends of said plates, substantially 60  
as described.

In testimony whereof I have signed my  
name to this specification in the presence of  
two subscribing witnesses.

BERNHARD BARON.

Witnesses:

JULIUS T. GROH,  
M. A. DENNIS.