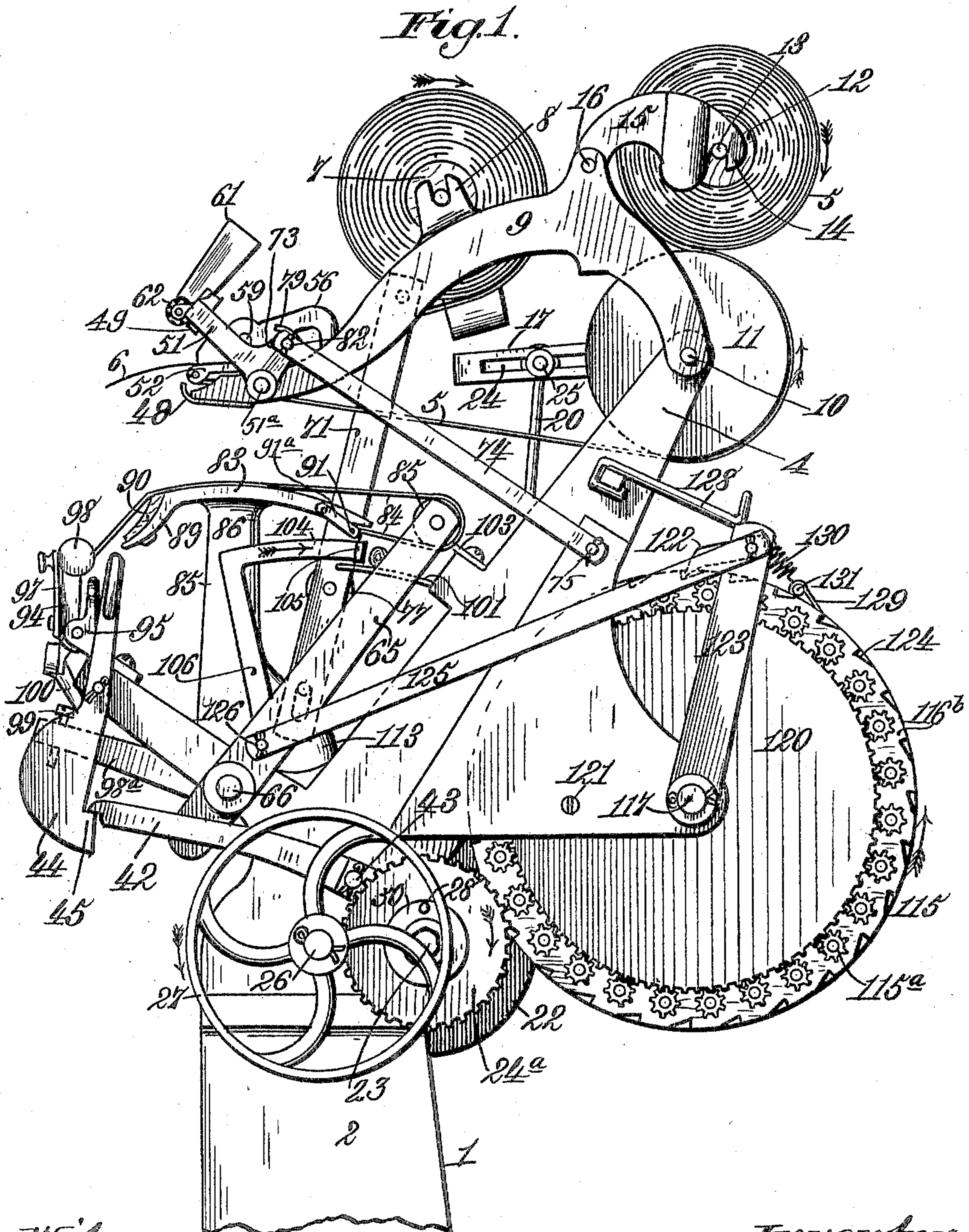


No. 817,254.

PATENTED APR. 10, 1906.

A. S. KOCH.
CIGAR BUNCHING MACHINE.
APPLICATION FILED AUG. 5, 1903.

8 SHEETS—SHEET 1.



Witnesses.

Robert Everett,

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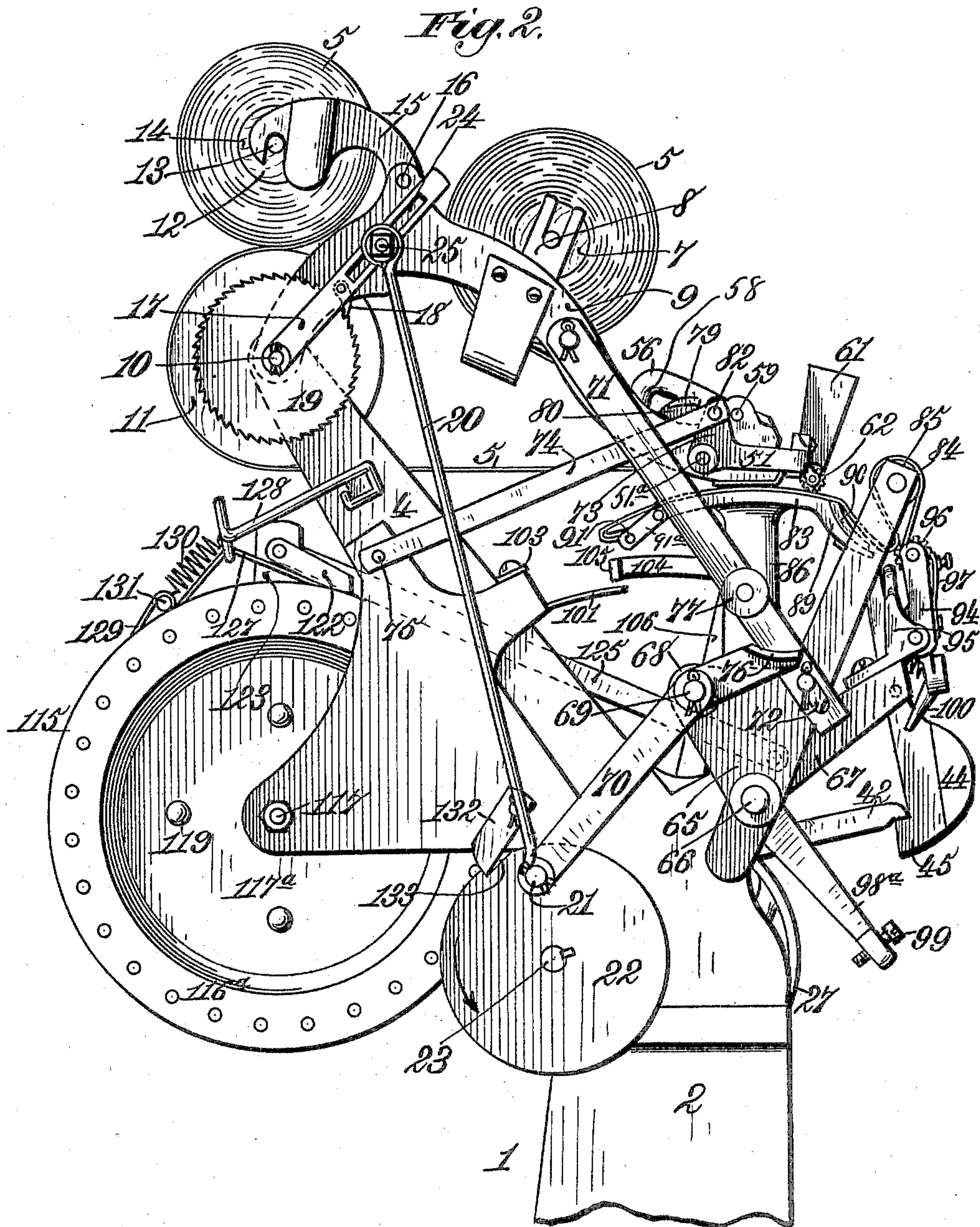
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8 SHEETS—SHEET 2.



Witnesses:
Robert G. Smith,
James L. Norris, Jr.

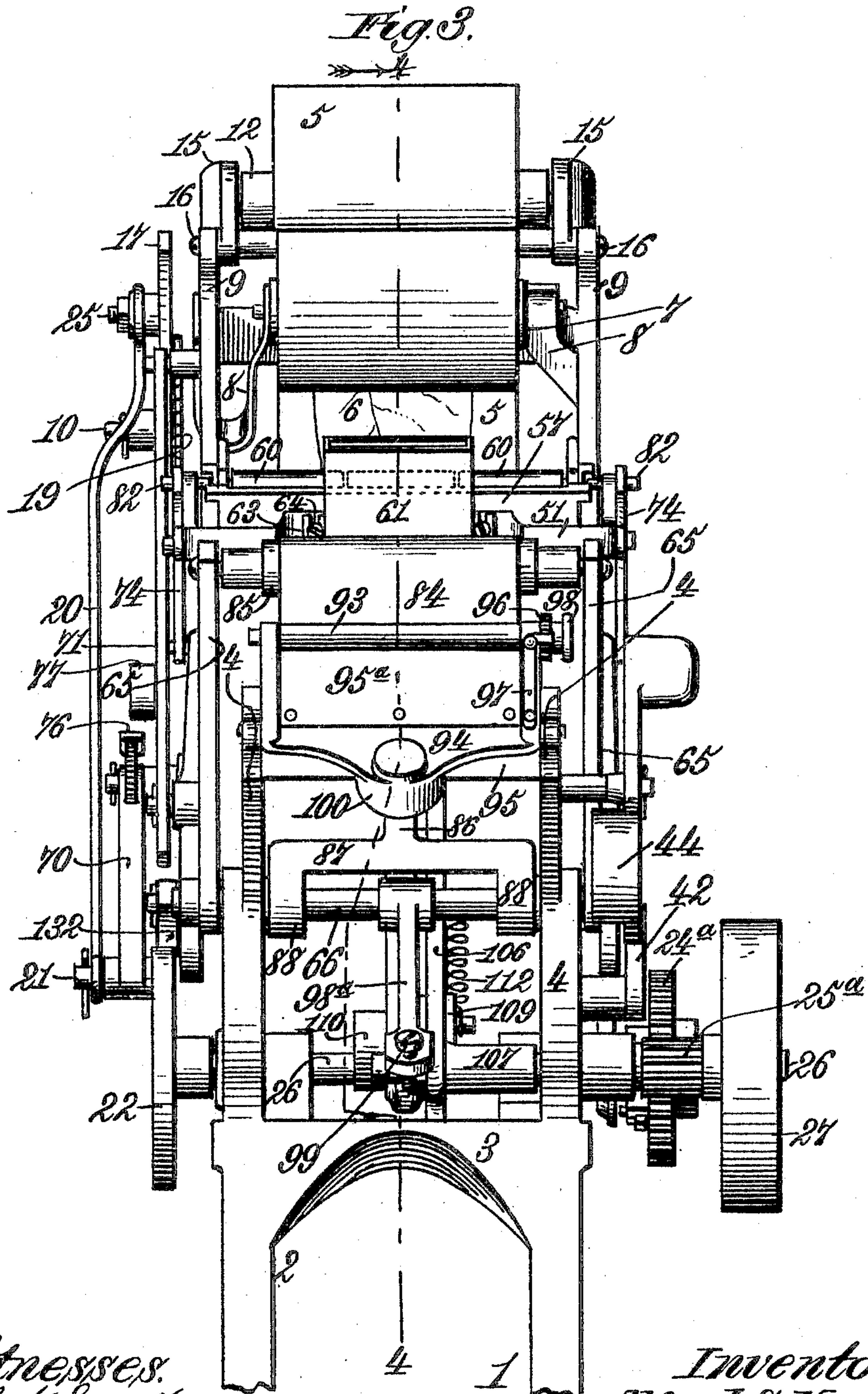
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8 SHEETS—SHEET 3.



Witnesses:
Robert Everett
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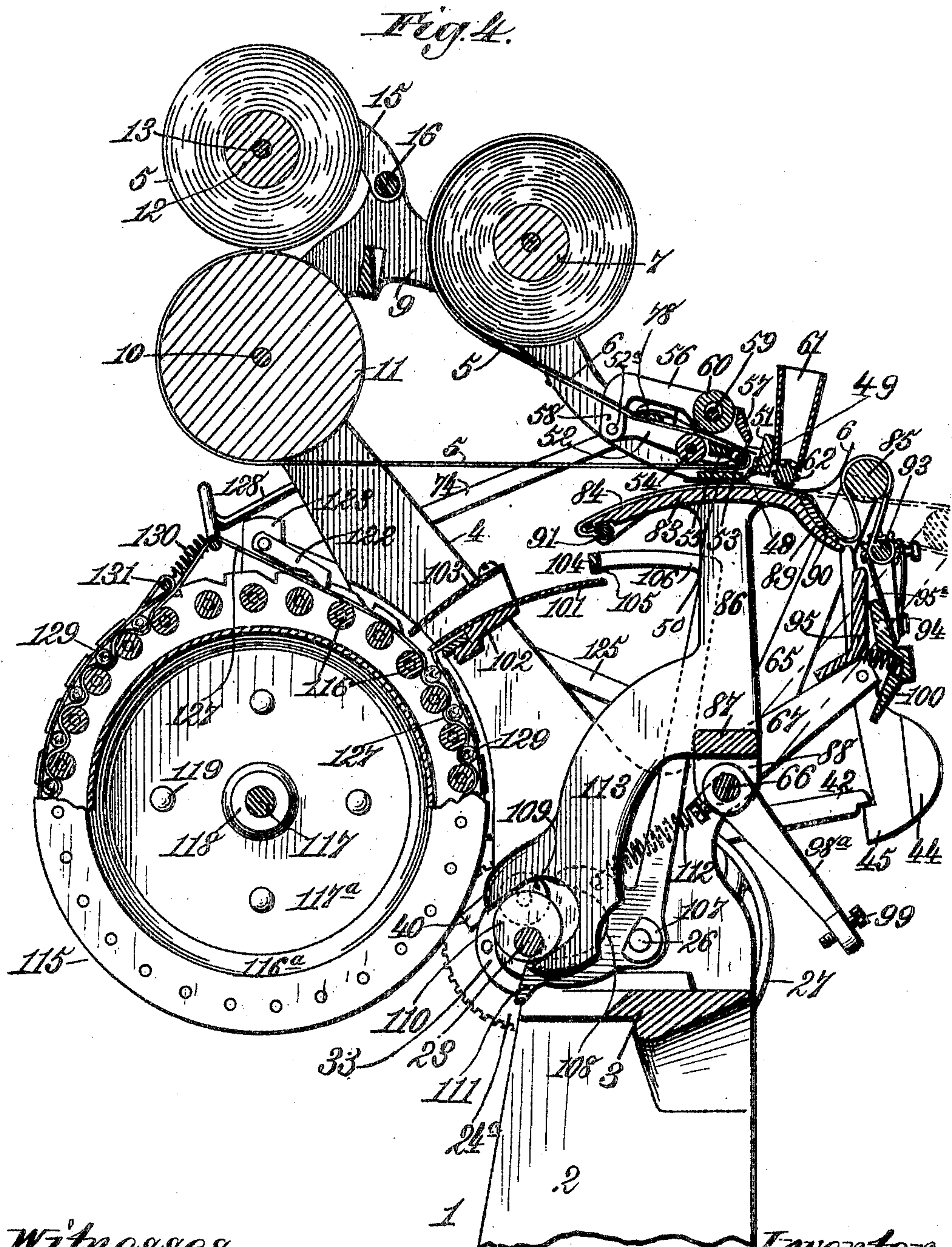
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6 SHEETS—SHEET 4.



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8 SHEETS—SHEET 5.

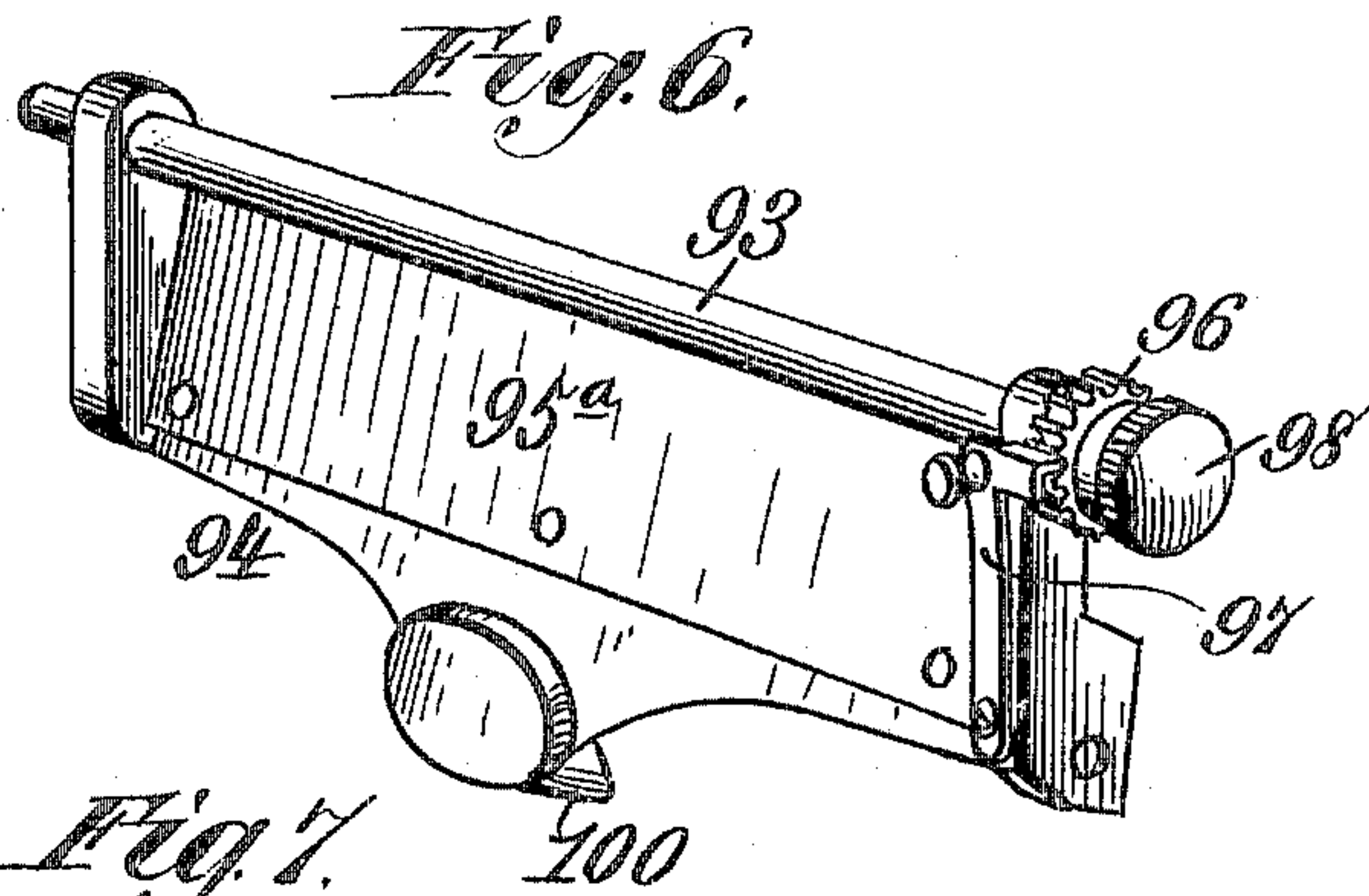
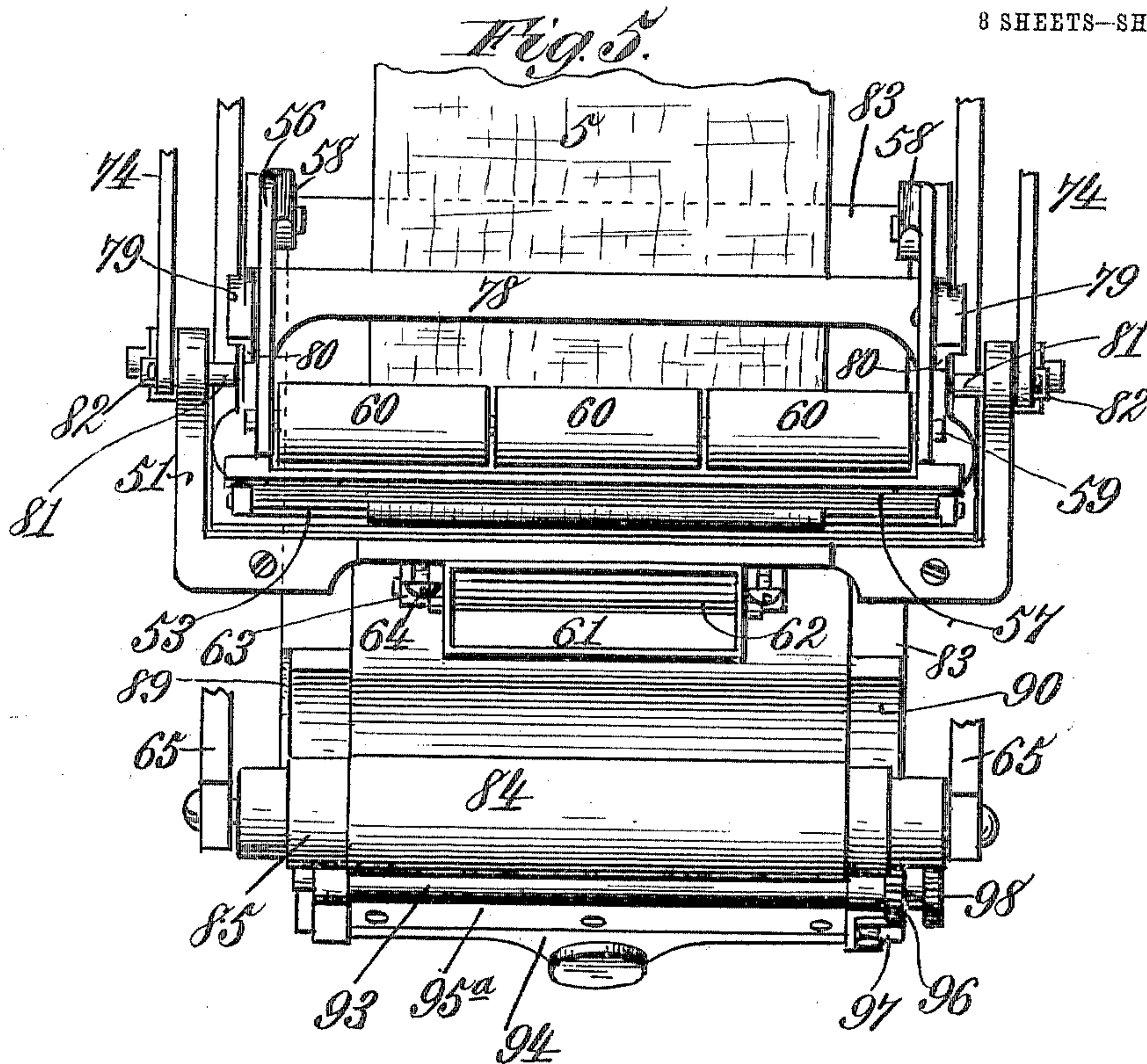
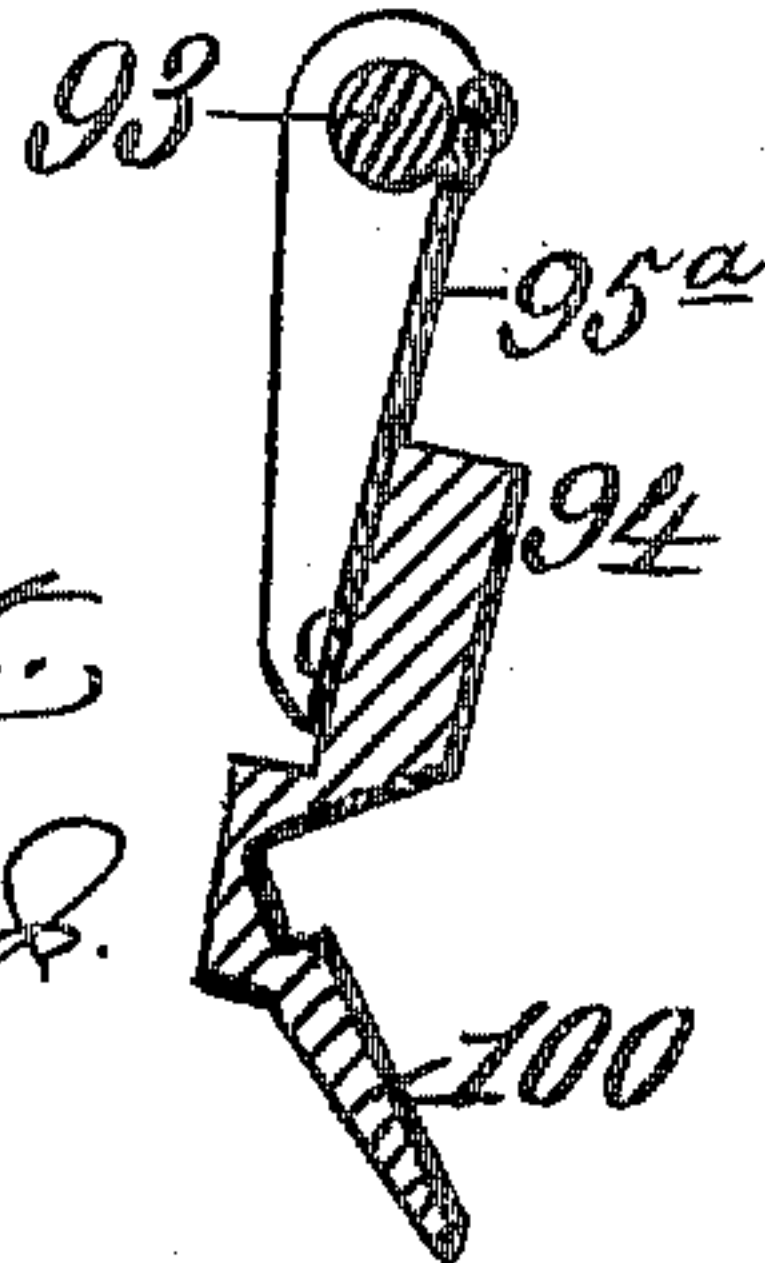


Fig. 7.



Witnesses:
Robert Everett.
James L. Norris.

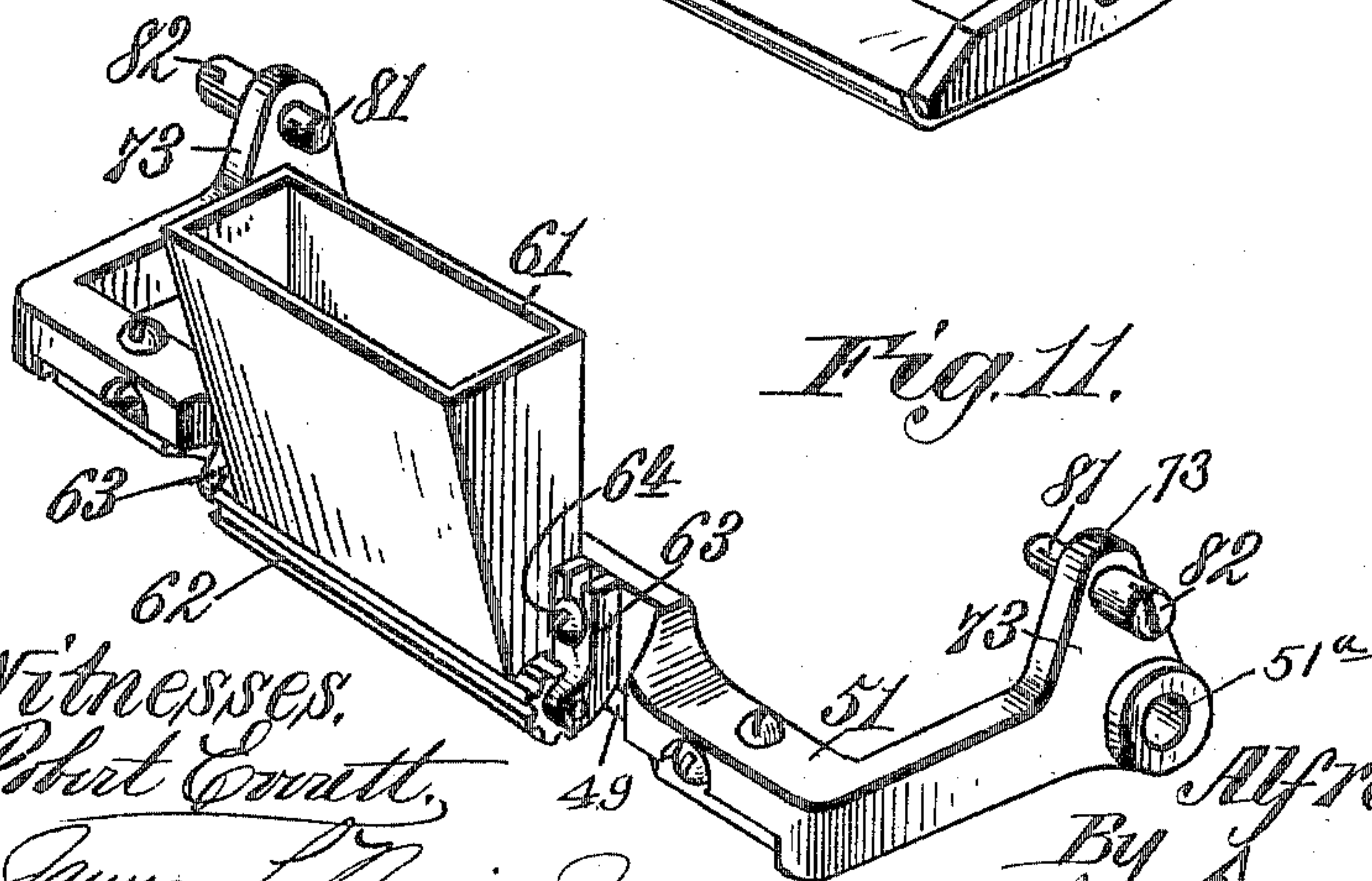
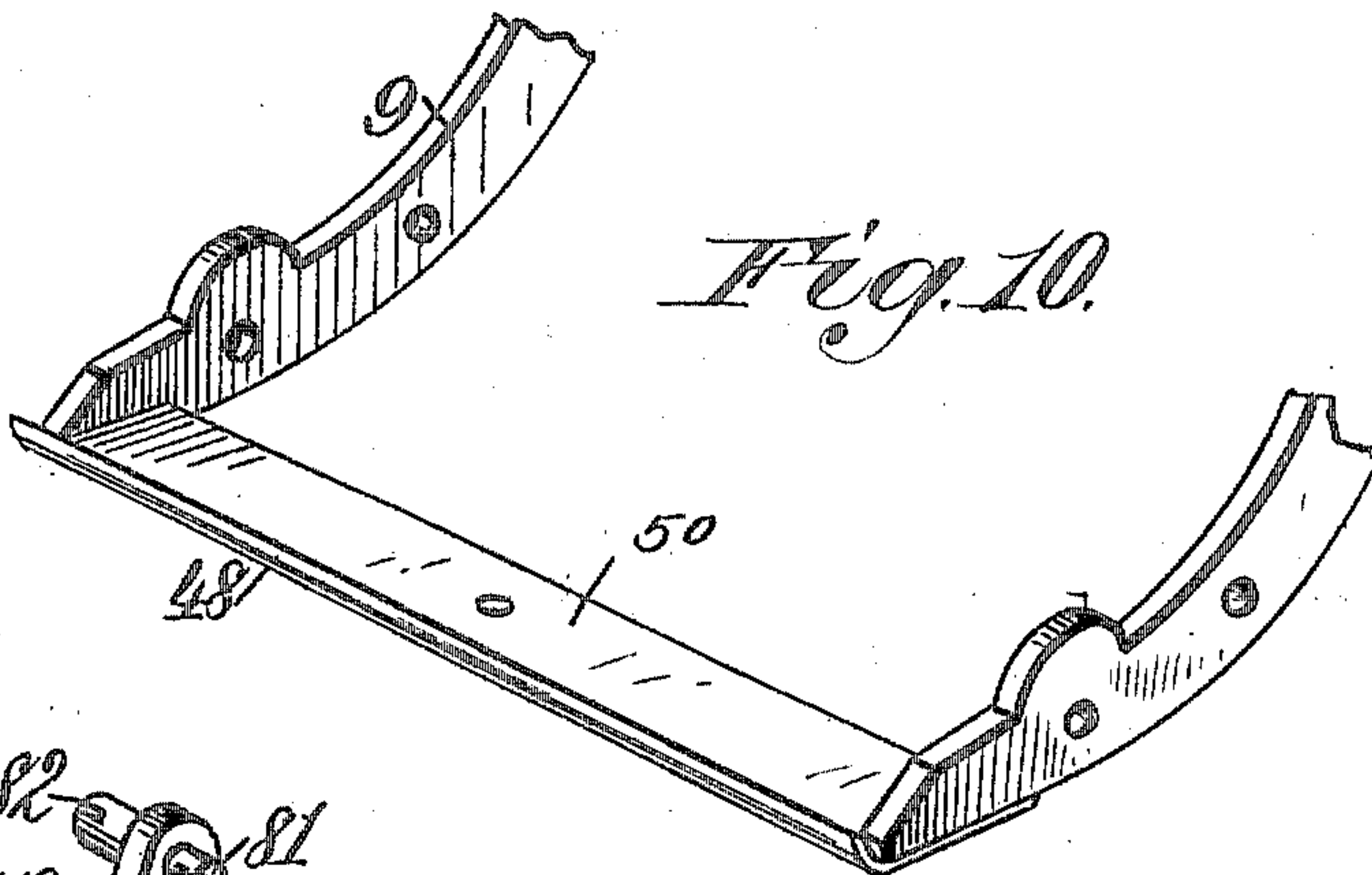
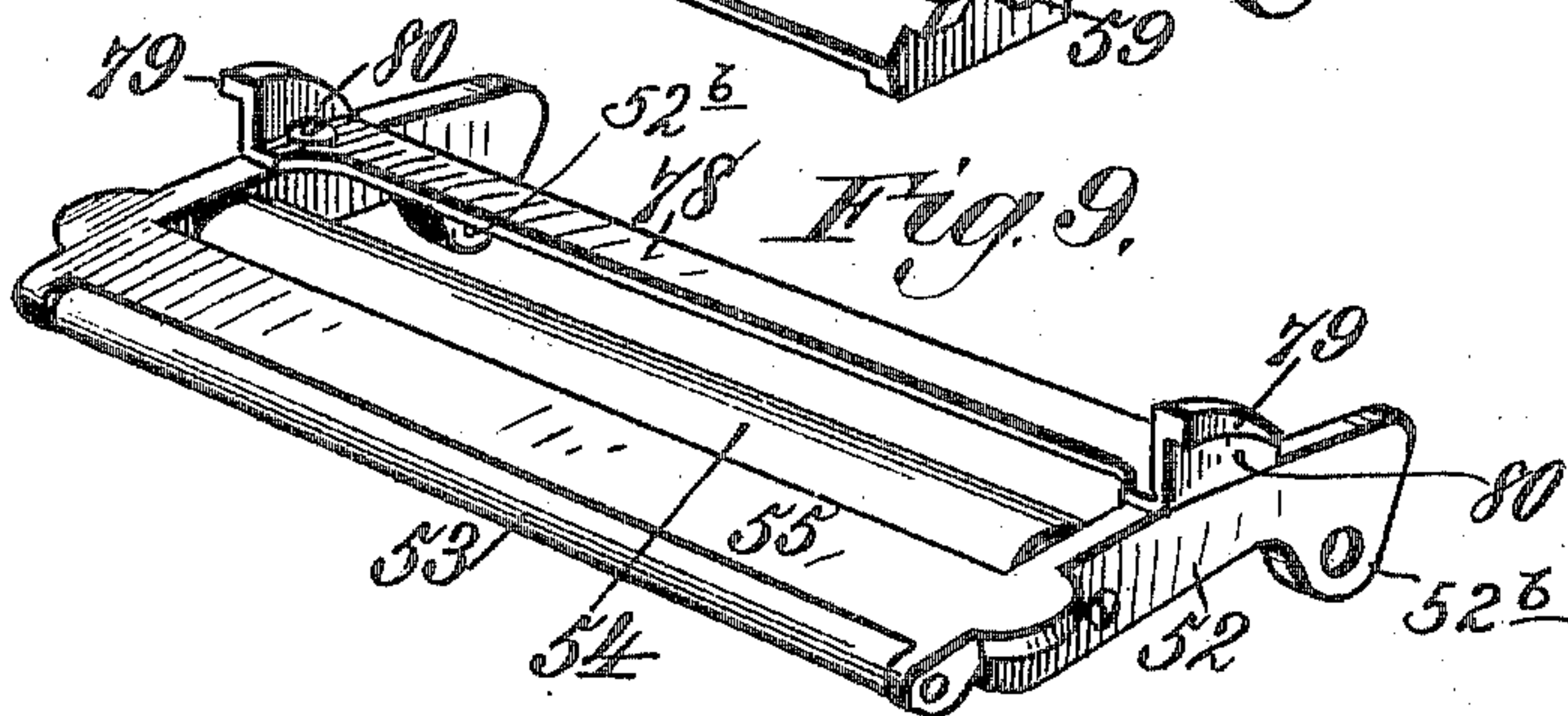
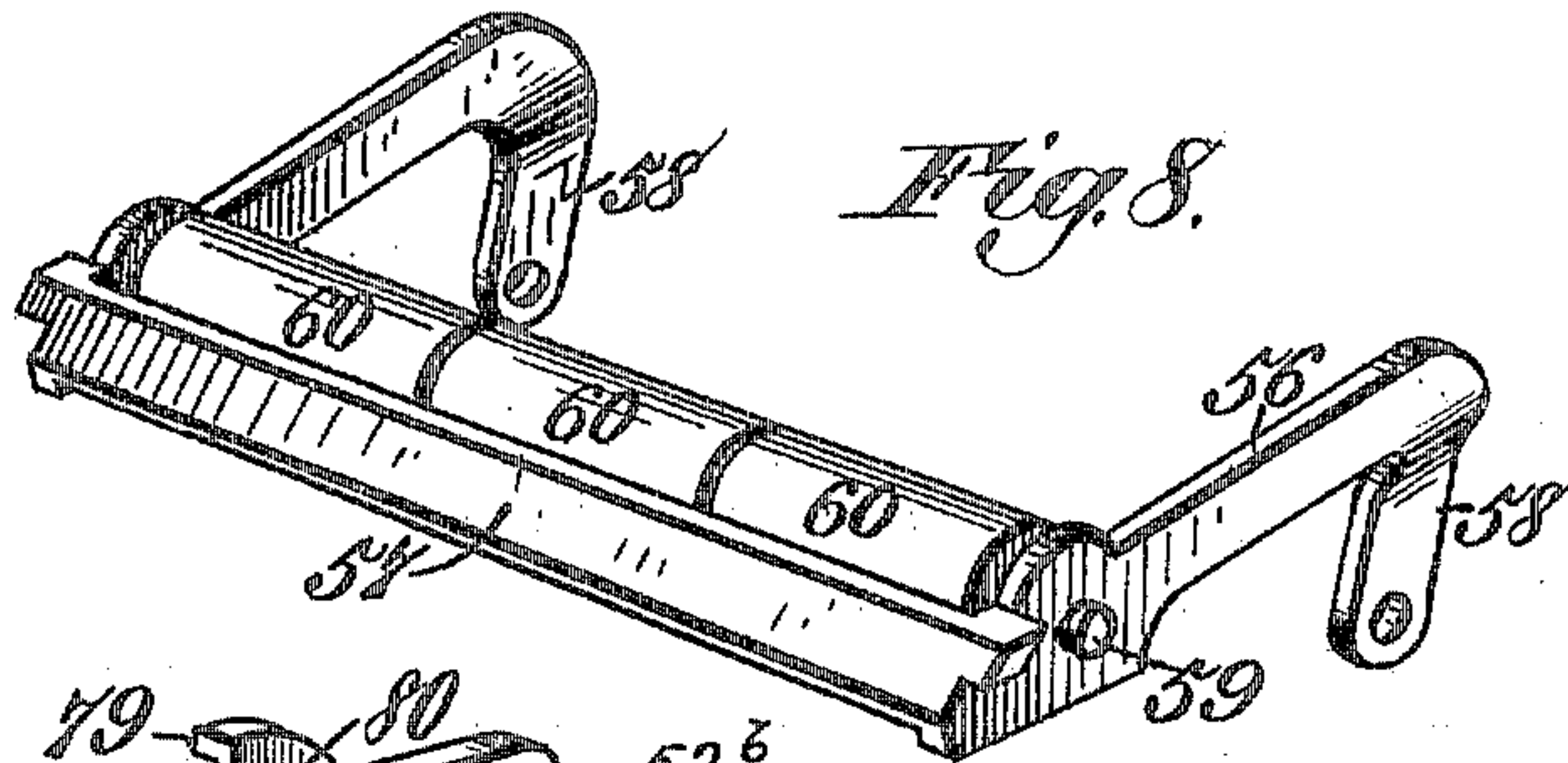
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8 SHEETS—SHEET 6.



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A. S. KOCH.
CIGAR BUNCHING MACHINE.

APPLICATION FILED AUG. 5, 1903.

8 SHEETS—SHEET 7.

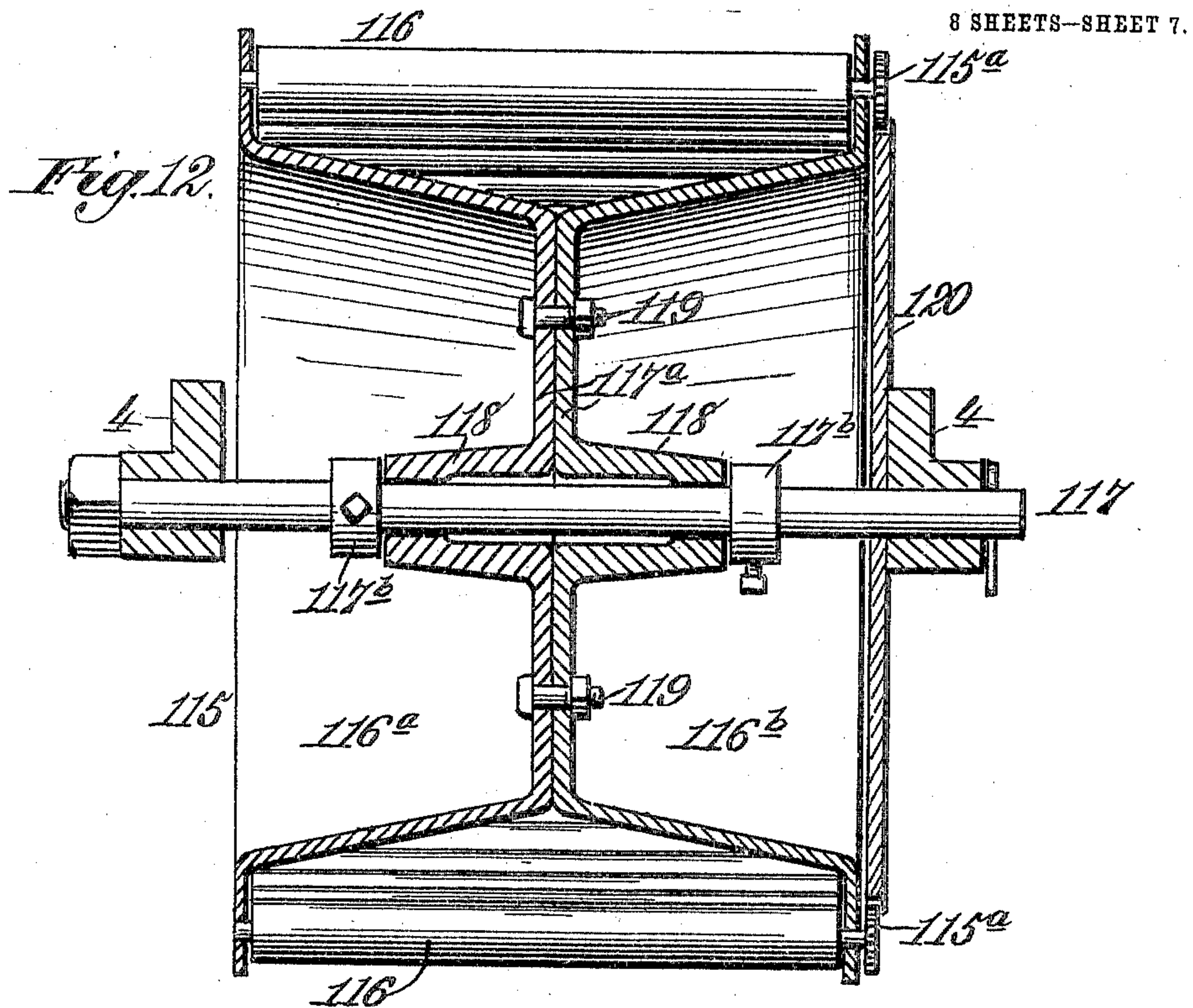


Fig. 13.

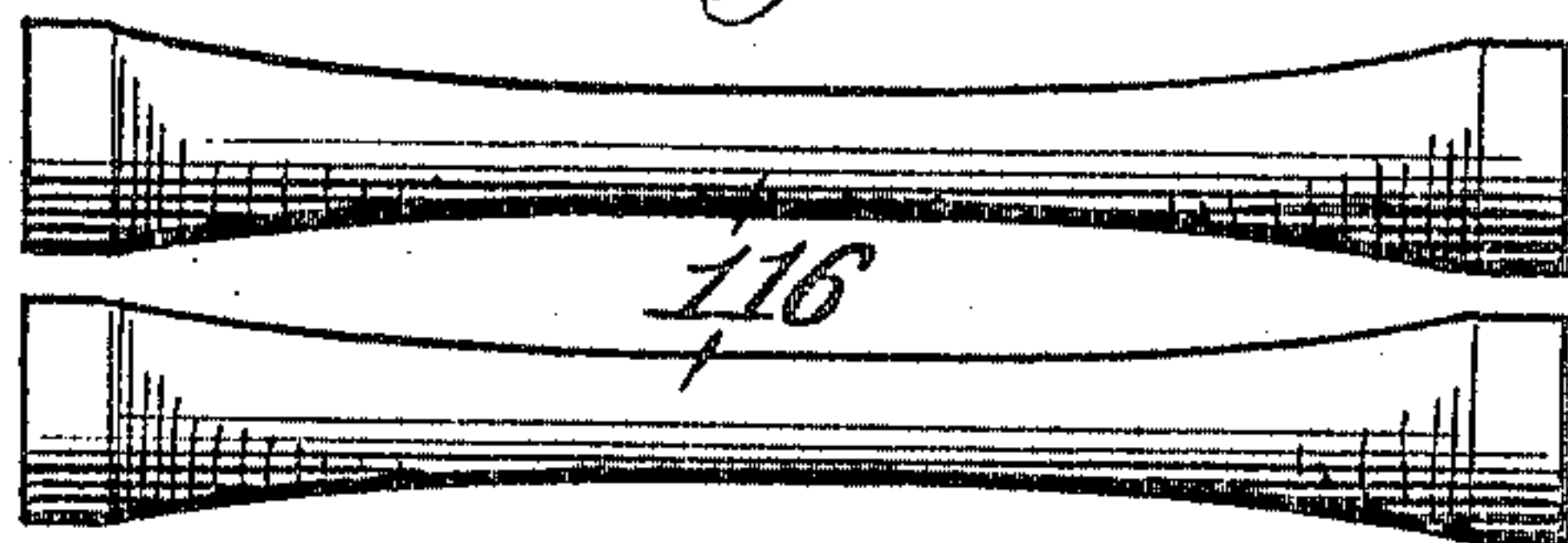
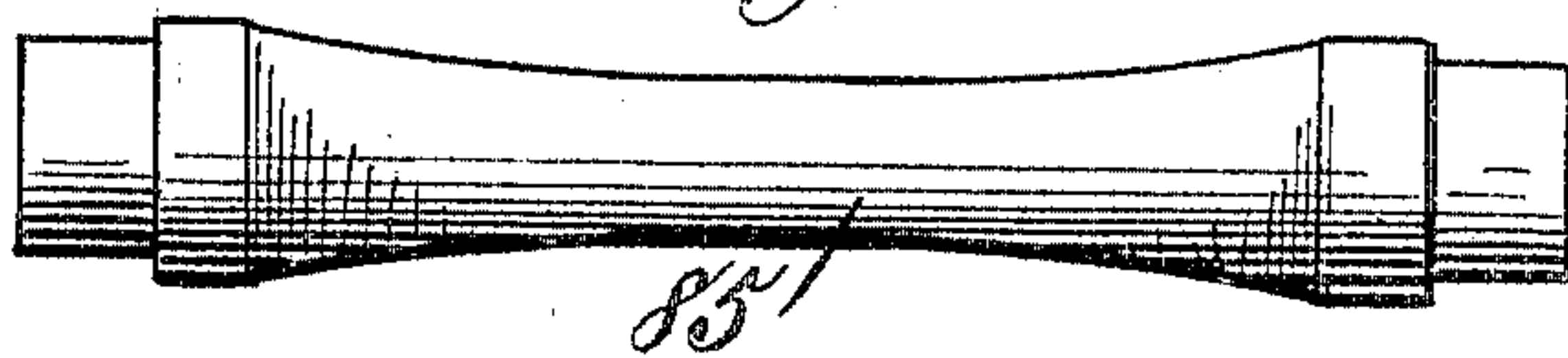


Fig. 14.



Witnesses:
Robert Corbett.
James L. Norris, Jr.

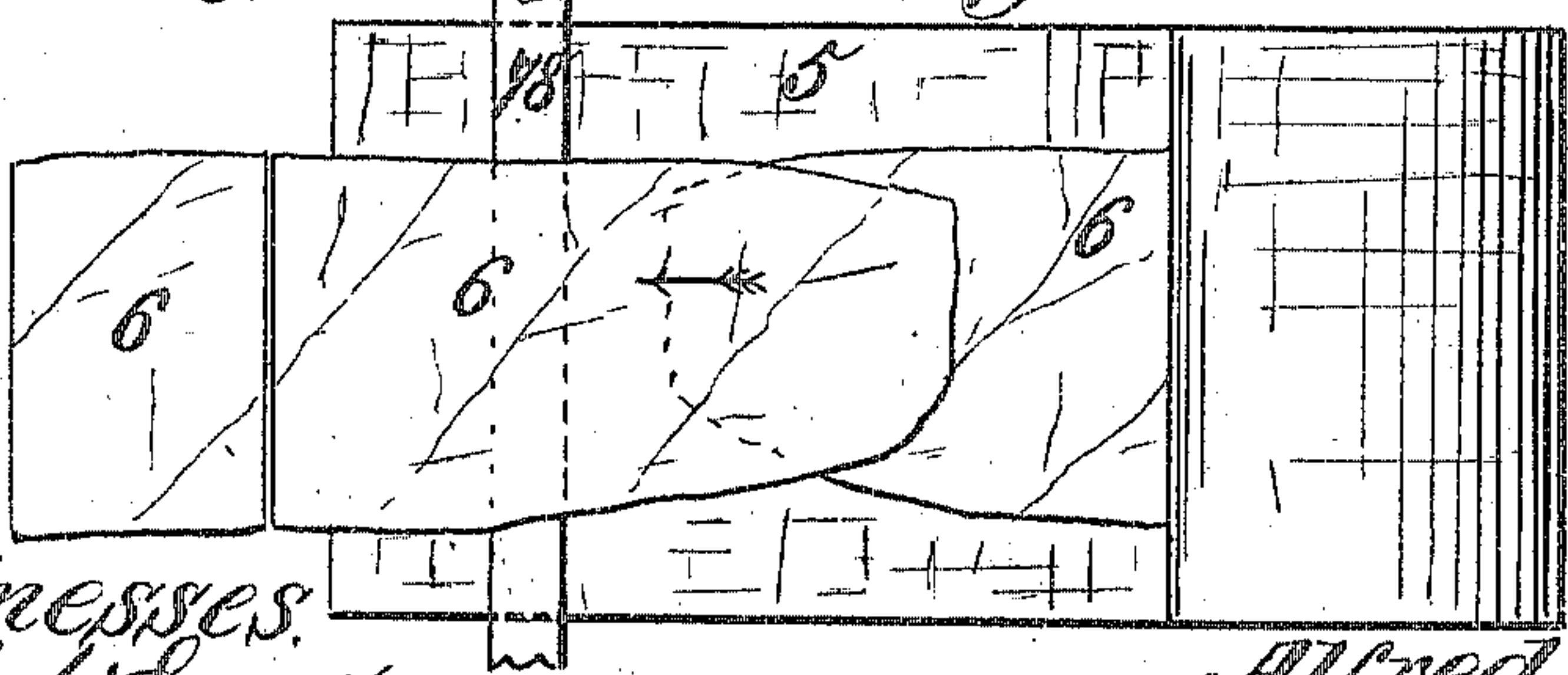
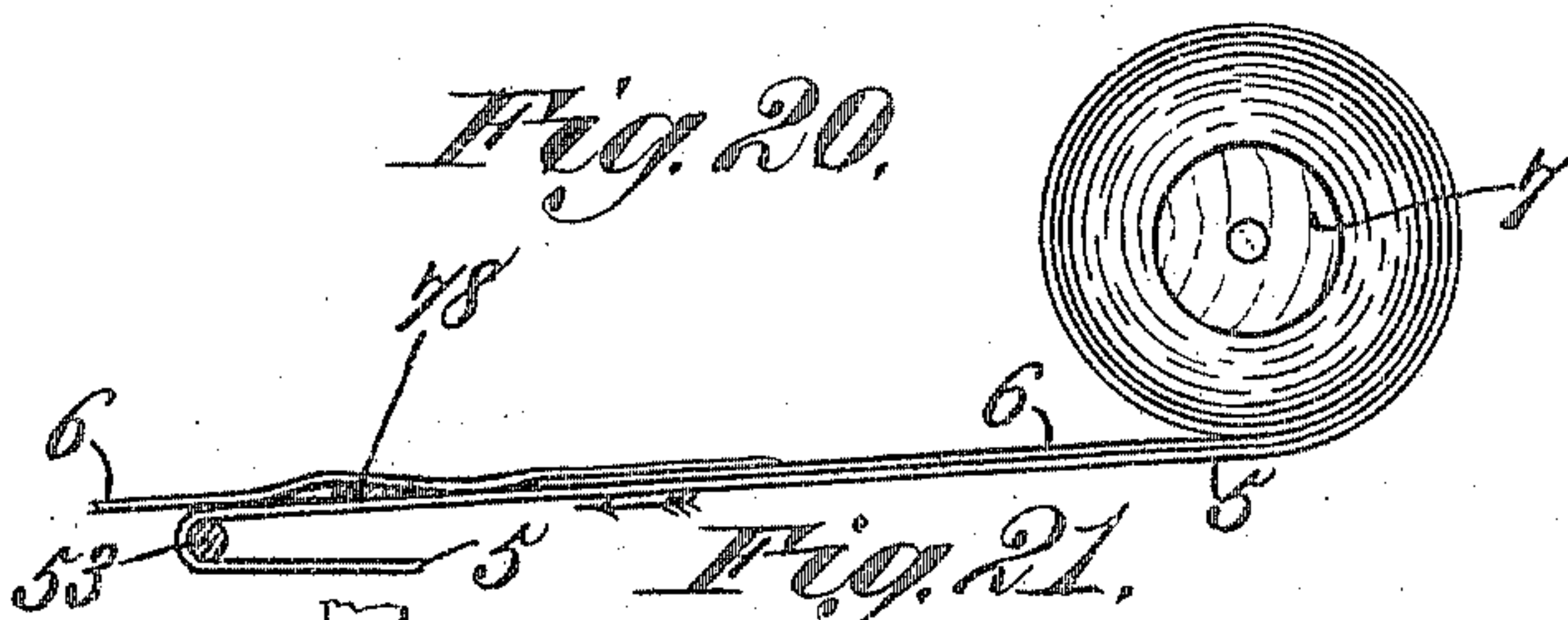
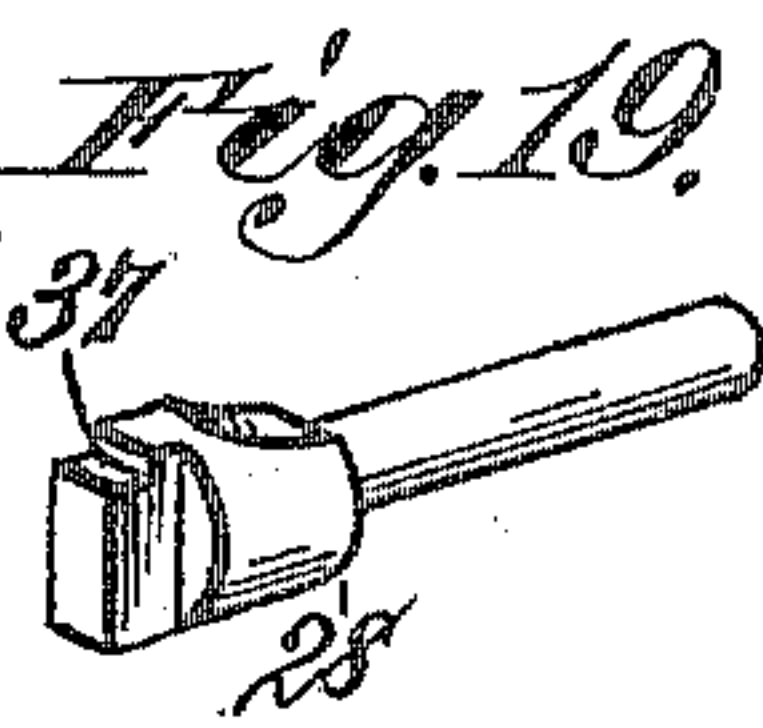
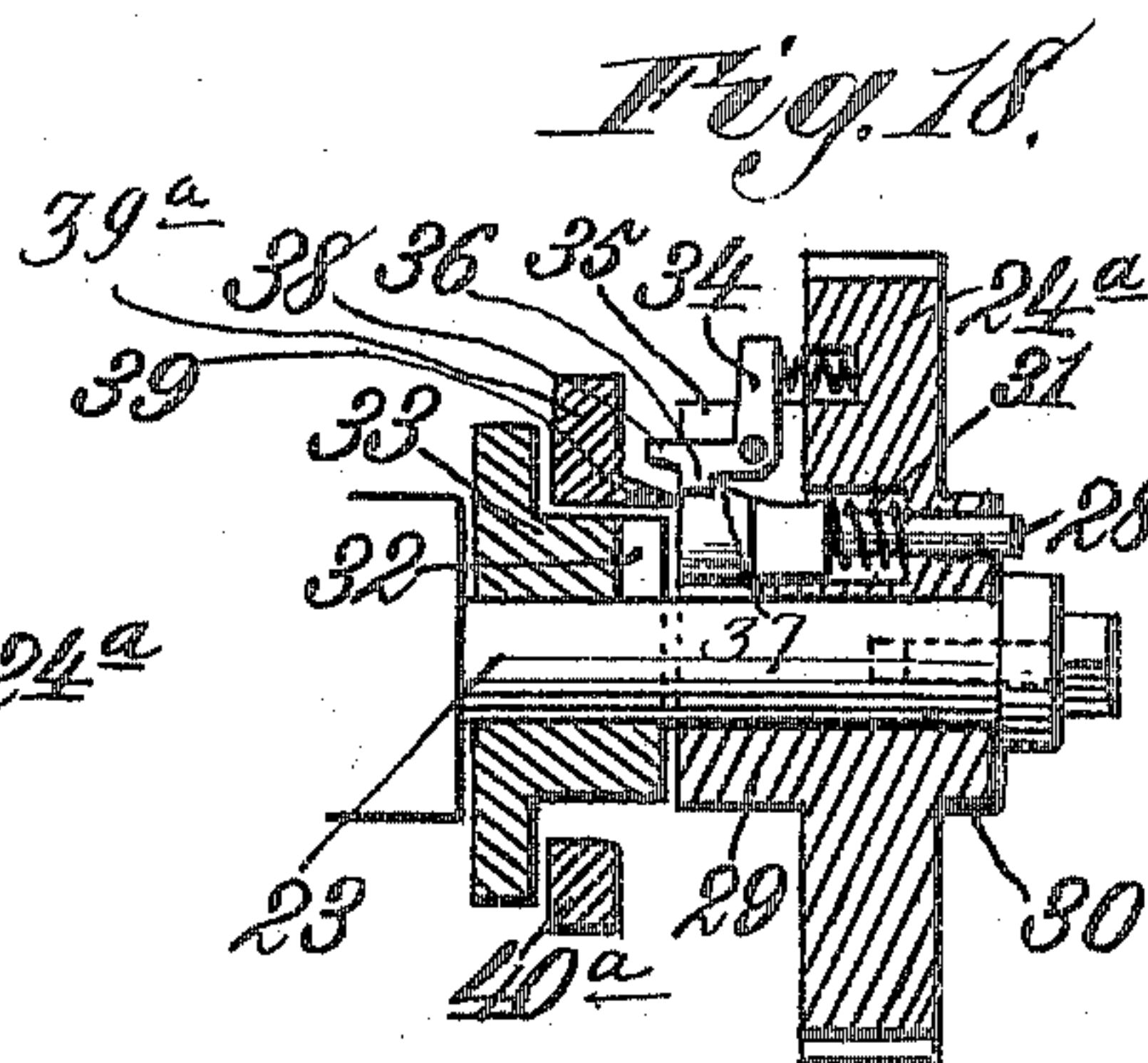
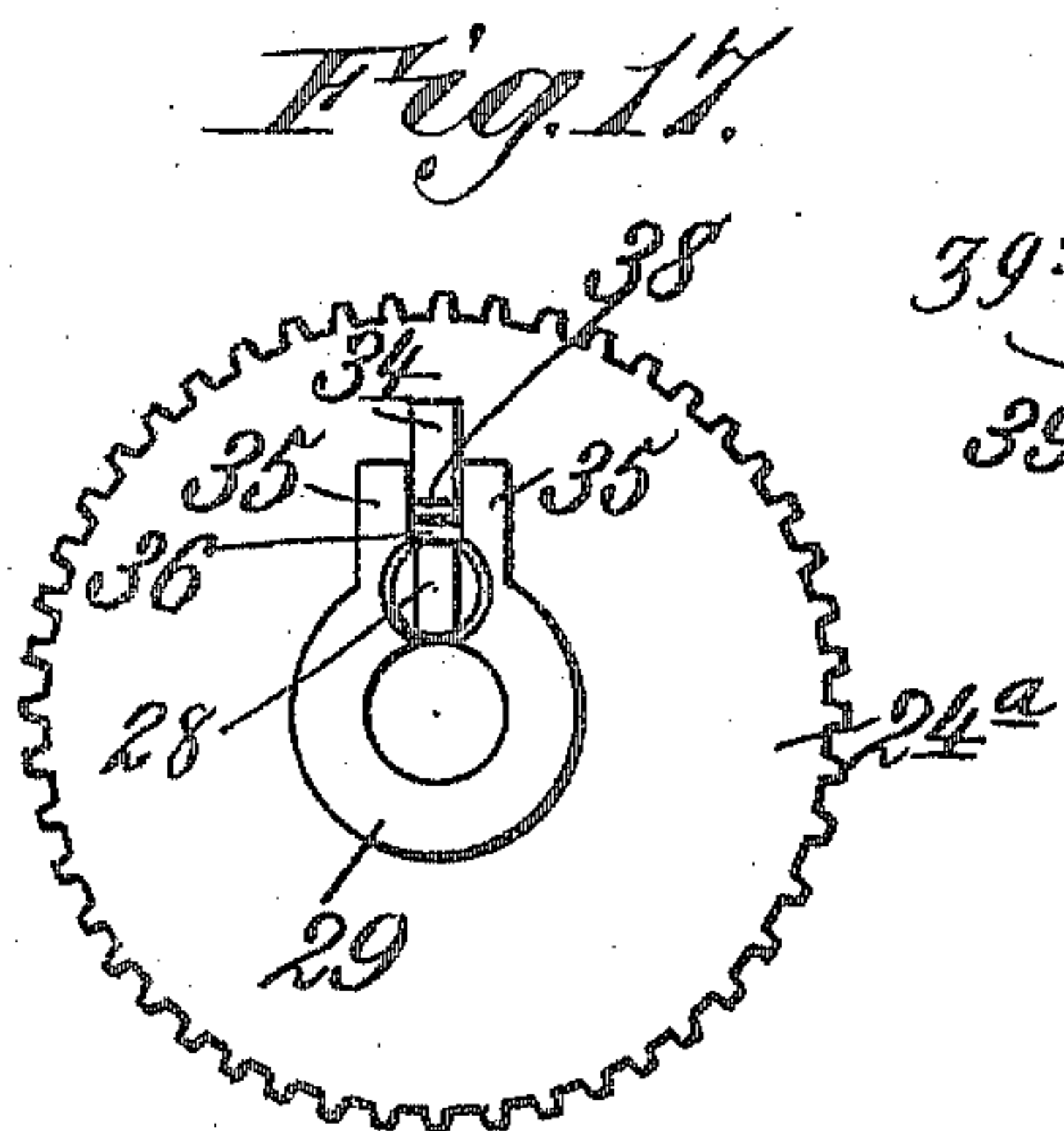
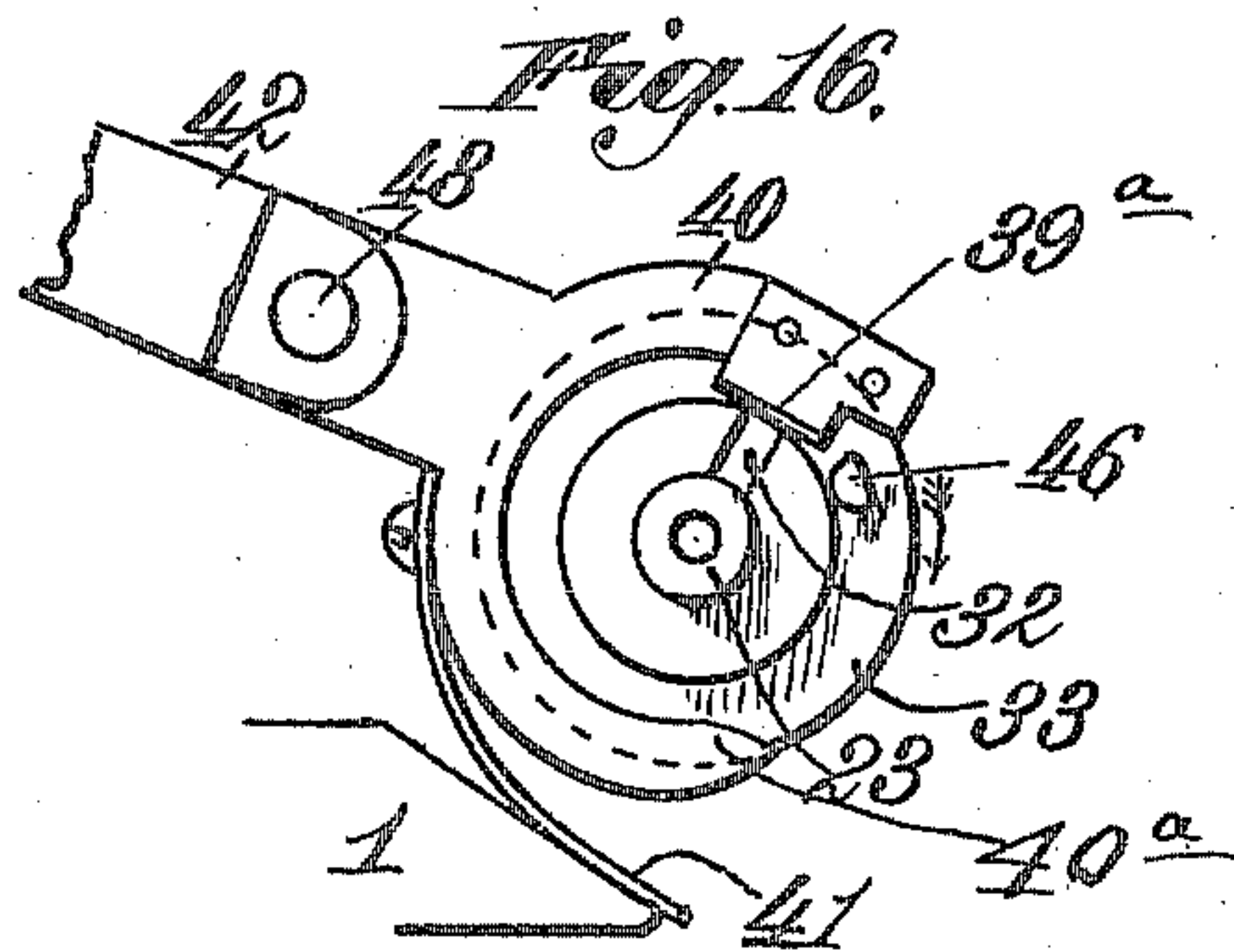
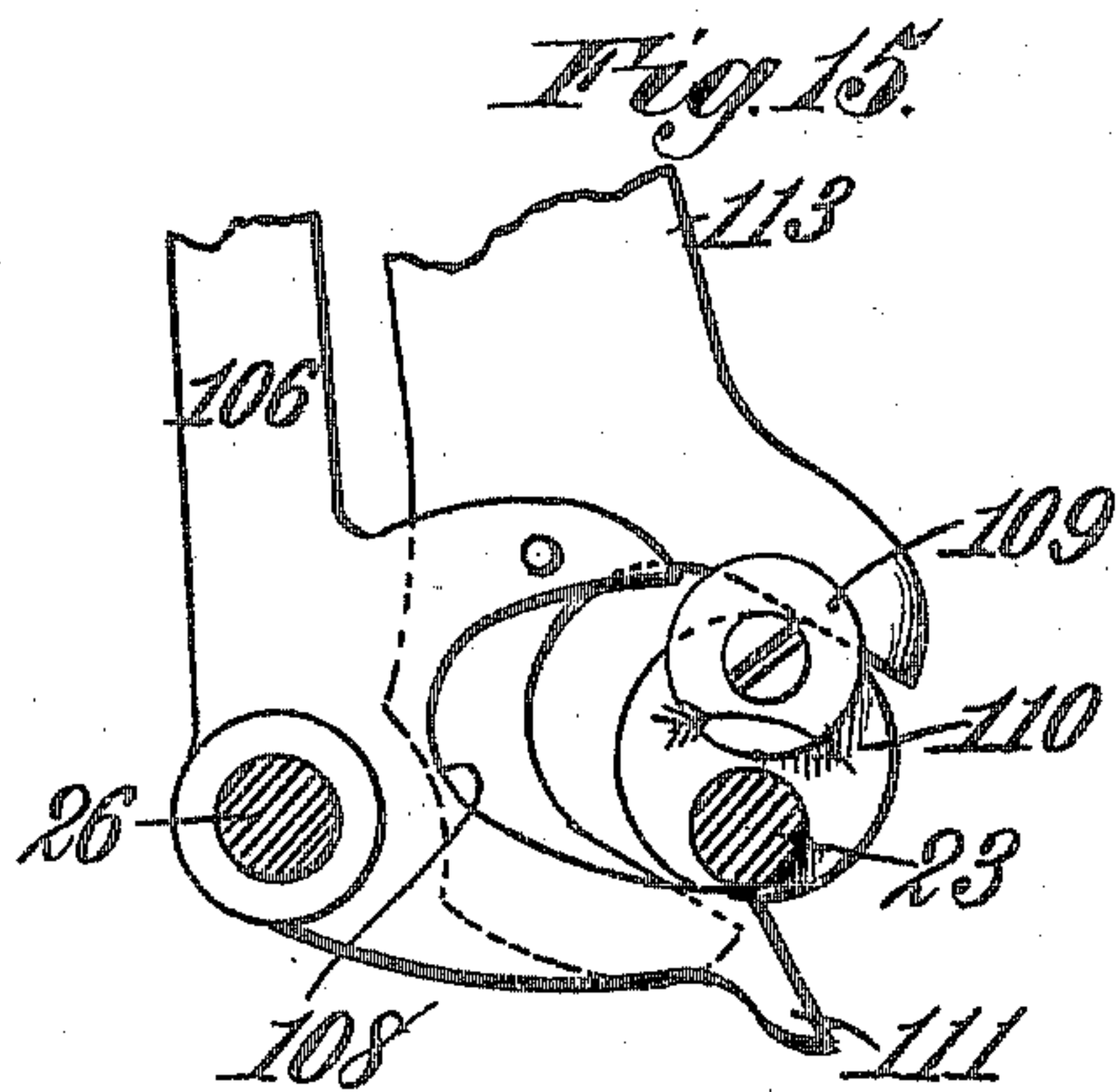
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No. 817,254.

PATENTED APR. 10, 1906.

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APPLICATION FILED AUG. 5, 1903.

8 SHEETS—SHEET 8.



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UNITED STATES PATENT OFFICE.

ALFRED S. KOCH, OF LANCASTER, PENNSYLVANIA.

CIGAR-BUNCHING MACHINE.

No. 817,254.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed August 5, 1903. Serial No. 168,339.

To all whom it may concern:

Be it known that I, ALFRED S. KOCH, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented new and useful Improvements in Cigar-Bunching Machines, of which the following is a specification.

This invention relates to cigar-bunching machines.

The objects of the invention are in a ready, simple, thoroughly-feasible, and practical manner and with the employment of the fewest possible number of elements, thus insuring certainty of operation and practical freedom of danger of derangement of the parts of the machine in use, first, to secure the maximum output of product in the minimum of time; second, to effect pronounced conservation of stock; third, to insure proper feeding of the binder to the filler; fourth, to effect proper shaping of a filler and the application of a binder thereto; fifth, to cause positive securing of the binder around the bunch; sixth, to maintain such tension on the binder as positively to obviate any wrinkling thereof, thus to insure its proper application to the filler; seventh, to prevent overfeeding of the binder; eighth, to obviate any tendency on the part of the binders to adhere to the binder-cutting mechanism; ninth, to insure positive discharge of the bunch from the bunch-forming mechanism, thereby to prevent any danger of clogging of the machine; tenth, to effect prolonged rolling and compressing of the finished bunch to insure proper shaping and positive application of the binder; eleventh, to obviate waste of binders by preventing unnecessary operations of the binder-feeding mechanism at times when the filler is not in position to receive a binder, and generally to improve the mechanism employed in the machine of the present invention.

The object first stated is attained by the employment of a continuous web, sheet, or roll of binders adapted automatically to be fed to the fillers. The binders are presented in the form of a roll and in this instance are shown as disposed between the plies of a strip of cotton or in any other suitable textile material, this for the purpose of maintaining the binders in a moist condition to insure their proper application to the fillers and also to prevent crumbling and splitting with attendant loss. It will be understood, however,

that the invention contemplates in its scope the employment of a web of tobacco to form binders, which may be presented in any form for the purpose designed, and thus it will be obvious that instead of confining the binders between a strip of fabric, which will preferably be moistened, the ends of the different binders may be connected and then formed into a roll around a suitable core, thereby dispensing with the employment of a sheet of textile fabric. By presenting the binder in the form of a continuous web the employment of an operator for the purpose of cutting the same into lengths suitable to bind the bunches is obviated, and as an operator only has to supply the filler it follows that a number of bunches greatly in excess of those secured by the ordinary form of bunch-making machine will result, as in the latter case it requires one operator to position the binder upon the machine and another to supply the filler.

The object second stated is attained by the employment of means for cutting or separating the binder into predetermined and exact lengths, and, as will presently appear, owing to the mechanical combinations utilized a much shorter length of binder can be used than where hand-labor is employed, thus in a manner that will be obvious effecting pronounced conservation of stock and securing a greater output of product with a given weight of binders than could possibly be secured if the same were cut into lengths by hand. The disposition of the terminals of the binders with relation to each other is such that where the narrow or end portions are presented to a filler the binding of the filler is as effectually secured as where a wide portion of a binder is presented, and by thus utilizing the entire length of the binders a further saving of stock is effected.

The object third stated is attained by a novel form of feeding mechanism which operates in a step-by-step manner and is so timed as to present the binder at the right moment to receive the filler, and in conjunction with this feeding mechanism there are employed pressure-rolls for causing the binders to impinge the moving textile strip, thus to insure positive feeding, said rollers being so constructed as to be operated irrespective of the texture or thickness of the binders—that is to say, whether they are of the same thickness throughout their width or are thicker on one edge than on the other. This

function is secured by mounting the pressure-rollers loosely on their shaft, thus allowing them to yield independently of each other, while at the same time exerting the requisite pressure to effect proper feeding of the binder.

The object fourth stated is attained by an oscillatory bunching-table, combined with a bunching-apron and a bunch-forming roller movable over the table and operating to form the bunch into a roll and at the same time to apply the binder thereto, suitable means being provided to adjust the tension of the apron so as to cause it positively to give the desired form and density to the bunch without danger of over or under pressing. The bunching-apron has combined with it suitable mechanism for imparting a tension thereon at the limit of the stroke of the bunch-forming roller, thus to cause positive discharge of the bunch from the apron, which if by accident should be retained therein would result in the clogging of the machine, and hence interruption of the operation thereof.

The object fifth stated is attained by the employment of a novel form of paste-applying device, the same being carried by the knife-supporting frame and having in its bottom a longitudinally-corrugated feed-roller which is rotated by the bunching-table, the corrugations in the roller being provided for the purpose of positively supplying a charge of paste to a binder in quantity sufficient to insure that it will properly be secured around the filler. The walls formed by the corrugations operate as knives to cut through the paste, and as it is a desideratum that the paste be thick, thus to enhance its adhesive qualities and to render it more rapid in drying, the corrugations are of value in this particular. While not shown, it will be understood that, if desired, a suitable automatic force-feed device may be combined with the paste-cup, such as a weight or a spring-pressed plunger. The movements of the machine are so timed that the separation of a length of filler and the application thereto of paste takes place just prior to the time that the bunching-apron assumes position to receive a fresh bunch, so that the forward movement imparted to the apron will be sufficient to move the binder a distance necessary to effect proper application of the paste. While a longitudinally-corrugated paste-applying roller is preferred, it will be understood that the invention is not to be limited to its employment alone, as one having a smooth periphery may be used and still be within the scope of the invention.

The object sixth stated is attained by the employment of a hinged element carrying the pasting mechanism and one member of the cutting device, said element causing the paste-applying roller positively to impinge the binder and force it against the bunching-

apron and to hold it in this position until drawn outward or away from the roller by the oscillation of the bunching-table, the co-action of the parts being such that the binder will not be released until its free end is taken up and partly wound around the bunch.

The object seventh stated is attained by the employment of a spring-pressed bearing in conjunction with the spindle or shaft of the roll of binders, the spring-bearing while permitting proper rotation of the roll operating positively to prevent any lost motion thereof, and thus overfeeding of the binders, which would result if the roll of binders were free to turn without impediment, in which case bunching of the binders due to overfeed would take place beneath the pressure-rollers or at the knife beneath the pressure-rollers, thus interfering with the proper operation of the machine.

The object eighth stated is attained by the provision of means for lifting one element of the cutting or separating mechanism at the instant that the forming-roll starts on its forward movement, thereby leaving the binder free to be wound around the filler without interference. Without the employment of this lifting mechanism for separating the members of the cutting device there would be danger of the binder being held back, so that an imperfect bunch would result or tearing of the binder might ensue. By the employment of the means described this is obviated in a positive manner and certainty of operation of the machine is insured.

The object ninth stated is attained by the employment of a plunger element coacting with the bunching-apron and being brought into operation at the exact instant that the bunch is released from the apron, said plunger mechanism operating to force the bunch away from the apron should it have any tendency to stick or be caught therein.

The object tenth stated is attained by the employment of a bunch rolling and compressing device, the same comprising a drum consisting of a plurality of rollers, each having a movement independent of the other and all being driven in unison under the operation of the drum, an endless apron surrounding the rollers serving to present pockets for receiving the bunch which are formed by the plunger in forcing the bunches therein. Combined with the drum and partially encircling the same is a shield or guard, preferably constructed of textile material and operating to hold the bunches within the pockets formed between the rollers, each of the bunches receiving a partial rotation at each operation of the bunching-apron, thus causing throughout an extended period a compressing and rolling action of the bunches, which will operate to give them permanent form and also insure the proper application of the binder. The shield or guard is of such

length that the bunches are successively discharged after they have made practically a complete revolution of the drum.

The object eleventh stated is attained by the employment of a novel form of clutch mechanism which is under the control of the operator and is rendered operable only when the filler has been placed within the pocket of the bunching-apron and is in condition to receive the binder. By this arrangement it will be seen that no waste of binder will occur, which would be inevitable if some means were not provided to prevent operation of the bunching-apron until the filler is properly positioned therein.

In describing the mechanism of this apparatus the construction and manner of assembling of the elements for effecting the above results will be divided into sections under headings indicating the different functions of the elements for performing certain results and in the order of operation of the machine, and afterward a full and explicit explanation of the successive steps leading up to the final result will be given.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, there is illustrated one form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied and changed as to shape, proportion, and exact manner of assemblage without departing from the spirit thereof.

In the drawings, Figure 1 is a view in side elevation taken from the right-hand side of the machine. Fig. 2 is a similar view taken from the left-hand side. Fig. 3 is a view in front elevation. Fig. 4 is a view in vertical longitudinal section taken on the line 4 4 of Fig. 3 and looking in the direction of the arrow thereon. Fig. 5 is a view in top plan of the front portion of the machine. Fig. 6 is a perspective detail view of a portion of the operating mechanism of the bunching-apron. Fig. 7 is a vertical transverse section through the center of Fig. 6. Fig. 8 is a detail perspective view of the upper knife and pressure-rollers. Fig. 9 is a perspective detail view of a portion of the cutting mechanism, showing more particularly the stripper-bar. Fig. 10 is a perspective detail view of the under knife. Fig. 11 is a perspective detail view of the paste-applying mechanism. Fig. 12 is a sectional detail view of the bunch storing and compressing mechanism. Fig. 13 is a detail view of a modified form of roller that may be employed in conjunction with the bunch storing and compressing mechanism. Fig. 14 is a detail view of a modified form of bunching-roller. Fig. 15 is a detail view in elevation of the cam mechanism for imparting a slight oscillatory movement to the bunching-

table and for actuating the bunch-projecting plunger. Figs. 16 and 17 are views in elevation of parts of the clutch mechanism for locking the machine against operation. Fig. 18 is a vertical sectional view through the mechanism shown in Figs. 16 and 17. Fig. 19 is a detail perspective view of the locking-pin of the clutch. Fig. 20 is a view in elevation of the binder-storing roll. Fig. 21 is a view in plan showing the manner in which the binders are disposed with relation to the strip of fabric between which they are confined.

In order to avoid confusion in defining the location of the parts of the machine, the term "front" will be employed to designate that part of the apparatus opposite which the operator stands, the term "rear" to designate that part of the apparatus farthest removed from the operator, and the terms "right" and "left" those parts of the apparatus on the right and left hand side of the operator.

Referring to the drawings, 1 designates the base or standard of the machine, comprising in this instance two pillars or uprights 2, connected at their upper and lower ends by webs 3, and projecting upward and at an incline to the base are rear brackets 4, on which are supported a portion of the operative mechanisms of the machine. By preference the base and brackets are formed integral, preferably by casting, to present a rigid structure and to reduce the cost of its manufacture; but it will be obvious that, if preferred, the parts may be made separate and assembled in any preferred manner.

Binder carrying and feeding mechanism.—The binder-carrying mechanism consists in this instance of a strip of textile material 5, between the plies of which the binders 6 are confined, the ends of the binders being overlapped, thus to present a continuous web or strip of tobacco, and where the textile material is employed the overlapped ends of the binder are generally not connected—that is to say, assembled by an adhesive—although if preferred, they may be connected in any suitable manner, as by being pasted together. In practice the muslin or cotton strip will be dampened to retain the binders in the best possible shape for use, or, if preferred, the strip of cotton may be dispensed with and the connected lengths of binder be rolled upon themselves in the form of a cylinder or be otherwise presented to the machine, the feature of this portion of the invention being to obviate necessity of manually cutting the binder into lengths to be applied to the filler. The roll of fabric and binders are mounted upon a roller 7, the journals of which rest in open-ended bearings 8, carried by a frame 9, the rear end of which is pivotally journaled on a shaft 10, carried by the upper ends of the brackets 4. Upon the shaft 10 is mounted a roller or drum 11, around which passes the fabric 5, the free end of the fabric being

wound upon a roller 12, mounted upon a shaft 13, the ends of which are journaled in open-ended bearings 14, carried by a bracket 15, pivotally connected at 16 to the frame 9. The open ends of the bearings 14 are disposed toward the drum 11, and this leaves the roll of fabric free to rest thereon, and as its diameter gradually increases the bracket 15 will yield automatically, and thus compensate for the increased size of the stored fabric. The object of the drum 11 is to keep the fabric under requisite tension and will cause it to be rolled smoothly and evenly upon the offtake-roller 12.

The feed-roller 7 has motion imparted to it, through the agency of the strip of material 5, by the drum 11, which is driven in a step-by-step manner by a vibratory arm 17, which is mounted upon the left-hand end of the shaft 10 and carries a pawl 18 to engage a ratchet-wheel 19, rigid with the said shaft. Vibrations are imparted to the arm 17 through the medium of a link 20, the upper end of which is adjustably connected with the arm and the lower end with a crank-pin 21, carried by a disk 22, rigid with the drive-shaft 23, as clearly shown in Fig. 2. As the arc traversed by the arm 17 determines the length of binder fed through the machine, it is requisite that means should be employed to vary the throw of the arm, thus to cause a long or short binder to be fed, as may be desired, and to effect this result the arm 17 is slotted at its free end at 24, and through this slot projects a locking-bolt 25, carried by the link 20. It will be seen that by moving the bolt through the slot different throws may be imparted to the arm, and thus variations in the feed of the binder may be secured.

The main drive-shaft 23 carries a gear-wheel 24^a, which latter meshes with a pinion 25^a, carried by a shaft 26, on which is mounted a pulley 27, around which passes a belt (not shown) running to any suitable source of power.

As before stated, one of the salient objects of this invention is to obviate any waste of binder, and this is accomplished by the provision of means for holding the bunching mechanism, presently to be described, against operation until the operator shall have placed the filler in position to be inclosed by the binder. To effect this result, a clutch mechanism is combined with the gear-wheel 24^a, which may be of the usual or any preferred construction for locking the gear 24^a on the shaft 23 and for allowing the same to run freely thereon when desired, the clutch mechanism in this instance comprising a spring-pressed pin 28, Figs. 18 and 19, which works in a bore formed in the hubs 29 and 30, respectively, of the said gear, a spring 31 serving at proper times to project the pin beyond the face of the hub 29, and thus in position to engage a recess 32, formed in a collar 33, rigid

with the shaft 23. When the pin is thus projected and is seated in the recess, the shaft 23 will be driven, and will thus impart motion to all of the operative parts of the apparatus to cause them sequentially to perform the functions for which they are designed. As, however, during the operation of the machine the pulley 27 rotates constantly, means must be provided to cause automatic retraction of the pin 28 and for holding it flush with the face of the hub 29, so that the gear 24^a will be free to rotate on its shaft until such time as the operator actuates the releasing mechanism, which will cause the pin 28 again to engage with the recess 32. The locking of the pin 28 into its retracted position is effected through the medium of an L-shaped spring-pressed dog 34, mounted between jaws 35, formed in an extension of the hub 29, said dog having a toe 36 to engage in a notch 37 in the locking-pin. The dog is provided with a nose-piece 38, Fig. 18, which projects beyond the face of the hub and has its upper face beveled to engage a cam projection 39, carried by one member 39^a of a yoke 40, which partially encircles the collar 33, a spring 41, Fig. 16, carried by the lower member 40^a of the yoke and bearing upon a fixed part of the base-operating normally to hold the cam in position to engage the dog, and thus trip it. To hold the cam normally out of the path of movement of the dog, the yoke is provided with an arm 42, journaled upon a stud 43, fast on the side of the base, the free end of the arm being adapted to be engaged by a pivoted counterweighted dog 44, mounted on a stud projecting from one side of the machine-frame. So long as the free end of the arm is in engagement with the nose 45 of the dog 44 the cam projection 39 will be out of the path of movement of the dog 34; but as soon as the operator trips the dog 44 the spring 41 lifts the member 39^a of the yoke, and thus moves the cam projection 39 into the path of movement of the nose-piece 38 of the dog 34, whereupon the latter will be tripped and release the pin 28, which will immediately engage with the recess 32, and thus lock the gear 24^a upon the shaft 23, and the gear will then make a complete revolution. As one revolution of the gear effects the formation of a bunch—that is to say, the rolling of the filler and the application of the binder thereto—it is essential in order to give the operator time to supply a fresh filler to the bunching mechanism that the machine should automatically stop at the moment the gear has completed its revolution, and to effect this the collar 33 is provided with a stud 46, which as the shaft 23 revolves engages with the lower member 40^a of the yoke and raises the arm 42, whereupon the dog 44 will again engage with the free end of the arm, and thus hold the cam-surface 39 out of the path of movement of the dog 34. As the arm 42 is raised the cam-surface 39

will of course be depressed, and thus be brought into the path of movement of the pin 28, the head of which will ride against the vertical face of the cam, thereby causing the pin to be moved laterally into its inoperative position, where it is held by the toe 36 of the dog 34 interlocking with the notch 37 until again released in the manner described. The operation of the clutch is simple and positive and by reason of its manner of construction will be capable of withstanding long-continued use without danger of derangement.

Binder-cutting and paste-applying mechanism.—The binder-cutting mechanism comprises in part two blades 48 and 49, the blade 48 being carried by a cross-bar 50, connecting the lower ends of the two arms of the frame 9, and the blade 49 being carried by a rocking frame 51, fulcrumed at 51^a on suitable journals carried by the arms of the frame 9, the blades being detachably connected with the parts that carry them in order to permit of ready removal for purposes of sharpening or otherwise. The edges of the blades are arranged on opposite inclines—that is to say, when open the gap between them is angular—so that as the two blades approach each other a shearing cut is provided which will positively effect severing of the binder. Pivoted at 52^a between the arms of the frame 9 is a frame 52, having perforated ears 52^b to receive the pivots and carrying two rollers 53 and 54, the roller 53 being arranged at the forward end of the frame and adjacent to the knives and the roller 54 being arranged back of the bar 55, that connects the two sides of the said frame, the function of the roller 53 being to reduce friction between the fabric and the frame as the former is moving thereover in the operation of the machine—that is, being wound upon the storage-roller 12. Pivoted to the rear ends of the arms of the frame 52 is another frame 56, comprising a front bar 57 and two rearwardly-projecting and downwardly-curved perforated arms 58, which are pivoted to the frame 9 at 52^a. Supported by the arms 58 in rear of the front bar 57 is a shaft 59, on which is loosely mounted a series of rollers 60, the same being adapted to coact with the roller 54 to hold the binder under requisite tension, and thus prevent gathering and overfeeding. As is well known, a binder of tobacco is thinner at its edges than at its center, and, moreover, the veins, which are irregularly disposed throughout the leaf, render it of uneven thickness. In feeding a binder through the machine if no provision were made to compensate for the irregularity in the thickness or texture of the leaf its proper application to a binder could not be secured, inasmuch as there would be a tendency for the thicker side of the binder to move more rapidly than the thinner side, owing to the increased pressure between the

friction devices upon that side, and the consequence would be that the binder would bunch or wrinkle on the thin side. By having the bores of the friction-rollers 60 of greater diameter than their supporting-shaft this objectionable feature is positively obviated, and by the employment of a plurality of these rollers equal pressure to all parts of the leaf is secured.

The paste-applying mechanism comprises the paste-cup 61, which is detachably connected with the front bar of the rocking arm 51 and is in this instance shown as a hollow rectangular structure having an open bottom beneath which is arranged a corrugated paste-applying roller 62, the corrugations being disposed longitudinally of the roller and the latter being supported by slotted ears 63, through which pass the screws 64, which serve to secure the cup to the cross-bar of the frame 51. As it is preferred to employ a thick viscid paste and one that will quickly dry in connection with the binder, it is found that an ordinary smooth cylindrical roller will not at all times prove effective in applying paste of this character; but by the provision of the corrugations the positive feeding of a sufficient quantity of paste to effect the proper securing of a binder around a bunch will always be obtained with a paste-roller of this character, inasmuch as the walls or cutting edges presented by the corrugations serve to shear or cut off a charge of paste, which will be carried around by the groove between such walls and be properly applied to the binder. In order that there may be no interference between the pasting and cutting mechanisms when the bunching mechanism is in operation and also any interference between the pasting mechanism and the binder when the latter is being fed forward at each operation of the bunching mechanism, means is provided which operates on the initial movement of the actuating mechanism to lift the cutting mechanism, paste-cup, and pressure-rollers upward a sufficient distance to allow the bunching-roller, presently to be described, to pass thereunder, and coincident with this movement a predetermined length of binder is fed forward in the manner already described. When the bunching-roller has performed its function and practically resumes its normal position, the cutting mechanism and paste-cup are lowered, and in this movement the length of binder previously fed forward is severed, the continued backward movement of the bunching-roller serving to move the binder forward a sufficient distance to cause proper application of the paste.

The movements of the cutting mechanism, paste-cup, and pressure-rollers described are secured through a pair of rocking arms 65, rigid with the shaft 66, journaled in bearings formed in bracket-arms 67, projecting from

the base portion of the machine toward the front thereof. One of the arms 65—in this instance the one on the left-hand side—is provided with a boss 68, from which projects a lateral stud 69, and on this stud is fulcrumed a lever 70, the lower end of which has a collar engaging the crank-pin 21 of the disk 22. As before stated, the disk 22 is positively driven from the gear-wheel 24^a and turns in the direction indicated by the arrow. The arms 65 are connected, through the medium of a link 71, with the frame 9, the lower end of the link being slotted at 72 to engage with a stud projecting laterally from the arms 65. While but one link 71 is herein shown, it will be obvious that, if preferred, there may be one at each side of the machine, and as this will be readily understood detailed illustration is deemed unnecessary. The side members of the rocking arm 51 are provided near their fulcrum-points each with an upward-projecting boss 73, and to each of these bosses is pivoted one end of a link 74, the other end of each of the links being pivoted at 75 to the bracket-arms 4 of the base. On the initial movement of the disk 22 the arms 65 are rocked toward the rear of the machine, and this movement is transmitted to the frame 9 through the medium of the link 71, causing the frame to be lifted to the position shown in Fig. 1, where it is held until the crank-pin 21 passes the dead-center, which period of time will be of sufficient duration to permit the bunching-roller to complete its oscillation and return nearly to its normal position. As the frame 9 is moved upward through the mechanism described the links 74 exert a pull upon the rocking frame and cause it to swing upward, carrying the upper knife and paste-cup away from the lower knife and leaving the incoming binder free to be projected forward to position, and until the crank-pin of the disk 22 has passed dead-center the said frame and its appurtenances will be held in raised position. As soon as the crank-pin passes dead-center the rocking frame 51 begins to descend, but is held from dropping through the medium of the links 74, and, as before stated, when the said frame 51 resumes its normal position the severing of the length of binder is effected. During the upward movement of the frame 9 the arm 17 is imparting motion to the drum 11 through the medium of the pawl 18 and ratchet-wheel 19, thereby feeding forward a fresh length of binder, the same being projected outwardly beyond the knives the proper distance. When the bunching-roller has nearly resumed its normal position, the frame 9 begins to lower, and upon reaching the limit of its downward movement the severing of the measured length of binder is effected. During the downward movement of the frame the arm 17 moves upward, thus bringing its pawl into proper position for subsequent action to ef-

fect turning of the feed-roller 11. The object in completing the cutting of the binder before the bunching-roller resumes its normal position is to permit the imparting of sufficient movement to the binder to cause the proper application of the paste, as before pointed out. When the crank-pin 21 passes dead-center, the natural tendency of the rocking frame 51, owing to its weight, will be to drop, and this would result in a premature severing of the binder and also pounding or jarring between the frame and the bunch-forming table, which would result in the disarrangement of the cutting mechanism. To obviate this defect, the lever 70 is provided at its upper free end with a cam projection 76, which is designed to engage with a friction-roller 77, carried by the link 71, the said friction-roller passing onto the cam projection at the time the crank-pin passes its dead-center, and the result of this arrangement is that the rocking frame and its appurtenances are caused gradually to resume their dropped or normal positions, effecting proper separation of the binder and the application of the paste thereto. As the binders are maintained in a moist condition while between the plies or turns of the fabric, there is a tendency for the binders to adhere to the fabric, and in the absence of any means to effect their separation therefrom there would be a tendency for the binders to be carried along with the fabric, thus passing the cutting mechanism and causing an interruption in the operation of the machine. To prevent this, a stripper-bar 78 is provided which is carried by the frame 52 and is provided at its rear side with a knife-edge which closely impinges the strip of fabric, and thus positively effects separation of the binder from the fabric in the operation of the machine, so that positive feed of the binder between the knives will always be secured.

As stated at the outset of the specification, it is essential that means be provided to obviate any tendency on the part of the binder to adhere to the cutting mechanism, which would result in an interruption of the operation of the apparatus, inasmuch as proper feeding of the binders to the fillers could not ensue, and to obviate this objection suitable means is employed for causing the upper knife to be lifted above or away from the lower knife at the instant that the bunching-roller starts to traverse the bunch-making table, thus leaving the binder free from any clamping action that might result between the two knives. The provision of such knife-lifting means is necessary in view of the fact that the paste employed in securing the binders around the fillers is of such character that there is liability of its gumming the edges of the knives, interfering with their cutting action, and causing the binders to adhere thereto. The mechanism employed for the pur-

pose comprises in part two cam projections 79, which in this instance are arranged at ears 80, carried by the ends of the stripper-bar, this arrangement being adopted merely for the purposes of convenience; but it will be understood that, if preferred, the said projections may be secured to the frame 52 and still be within the scope of the invention. The cam projections are adapted to be engaged by roller-bearings 81, carried by the fulcrum-pins 82 of the links 74, said pins being suitably secured to the bosses 73 of the rocking frame 51. On the initial upward movement of the rocking frame 51 the friction-rollers 81 pass beneath the cam projections, thus lifting the upper knife from the lower knife, freeing the severed binder from engagement with the two knives, and leaving it free to be drawn around the filler. The friction-rollers remain in contact with the cam projections until the frame 51 practically resumes its normal position, so that throughout the entire reciprocation of the bunching-roller there will be no interference between the frame and the binder and no interference between the binder and the cutting mechanism. By the arrangement of mechanism defined a positive feed of the binder to the filler is at all times secured, and even an accumulation of paste will not interfere with the proper operation of the machine. It may be salient at this point to remark that owing to the divergent disposition of the cutting edges of the knives with relation to each other they are practically self-sharpening, so that they are capable of long continued use without removal from the machine. Moreover, if after the knives have been sharpened their cutting edges do not exactly register after a short period of use any inequality will be removed, due to the presence in the leaf of a certain amount of silicious material, which will tend not only to cut down the steel, but also to effect sharpening.

Bunch-forming mechanism.—The bunch-forming mechanism embodies in its construction a bunching-table 83, a bunching-apron 84, and a bunching-roller 85. The bunching-table is provided, as usual, with an upper curved surface carried by a standard 86, which latter is journaled on the shaft 66. In order to insure evenness of operation of the table, the standard is provided at its lower end with a cross-bar 87, from which depend two ears 88, which are perforated for the reception of the shaft 66, and by this arrangement an extended bearing is provided for the table which will prevent any vibration during its oscillations which would result in the uneven application of the binder to the filler. The forward end of the table is formed with a downward curved portion 89, in which is adjustably mounted a filler-block 90, and in the construction of the same a plurality of these filler-blocks may be provided to meet

the requirements arising from bunches having different diameters. Of course it will be apparent that, if preferred, the filler-block may be omitted, as where the machine is designed to make bunches of only one size; but by the provision of a plurality of the filler-blocks the range of usefulness of the machine is extended, so that any kind of a bunch, from a small bunch such as employed in the manufacture of stogies to a large thick bunch such as employed in the manufacture of a heavier grade of goods, may be accomplished with readiness and ease.

The bunching-apron 84 is constructed of any material suited to the purpose, preferably of rubber-coated muslin or any other material that will be impervious to the passage of moisture. The rear end of the bunching-apron is secured to a bar 91, the ends of which are supported in spring-brackets 91^a, secured to the sides of the bunching-table, and by this arrangement detachment of the rear end of the bunching-apron from the table may be readily accomplished when it is desired to supply a fresh apron for one that has become damaged or otherwise unfit for use. The front end of the apron is secured to a roller 93, carried by a spring-retracted trip-plate 94, the said plate being pivotally mounted upon a bracket 95, secured to the arms 67 of the frame, a spring-plate 95^a, carried by the trip-plate and bearing against the apron, serving to hold it from unwinding. The action of this spring-plate is to bear against that part of the apron which is rolled upon the roller 93 and prevent it from becoming loosened or unwinding, which would disturb the adjustment of the apron. When the apron is adjusted in respect to its length, by winding a portion thereof upon the roller 93, as will be described, if the portion so wound be not held thereon when the bunching-roller moves to form the bunch-pocket there would be danger of slack between the bunching-roller 85 and the roller 93, and this would cause that part of the apron which is rolled upon said roller 93 to partially unwind or loosen up, and thus disturb the adjustment of the apron and the size of the bunch-pocket. It is the function of this spring-plate 95^a to prevent possibility of such occurrence, said plate constituting a resilient means for holding or maintaining the adjusted length of the apron. One end of the roller 93 carries a ratchet-wheel 96, which is engaged by a spring-catch 97, the ratchet-wheel and catch being provided for the purpose of holding the apron at the desired adjustment. In other words, should it be desired to make a bunch of relatively large diameter the apron will be lengthened, whereas if it be desired to make a bunch of relatively small diameter the apron will be shortened. To effect turning of the apron 84, one end of the roller 93 is provided with a knurled or milled thumb-piece 98. The

bunching-roller, as before stated, is carried by the rocking arms 65 and may be a true cylinder, as shown, which will be adapted for the manufacture of straight bunches, such as are employed in connection with the manufacture of stogies, or may be concave where an ordinary cigar-shaped bunch is to be made. As will be seen by reference to Fig. 2, the bunching-apron is of sufficient length to permit a loop or bend to be formed between the bunching-roller and the filler-block or forward curved portion of the bunching-table, and in this pocket the filler is supplied by the operator. As the rocking arms are moved rearward the bunching-roller passes onto the curved surface of the bunching-table, thereby inclosing the filler and binder within the pocket, as is usual, and causing the proper formation of the bunch and the application thereto of the binder.

As stated at the outset of the specification, one of the objects of this invention is to insure positive discharge of the bunch from the bunch-forming mechanism, and this is effected through the medium of the trip-plate 94 in the following manner: When the bunching-roller reaches the limit of its rearward stroke, the bunch is still held in the loop or pocket formed by the bunching-apron, and owing to the presence of the paste, a small amount of which is apt to be transferred to the bunching-apron, the bunch is liable to adhere to the latter. To effect the release of the bunch, a slight stretch or pull is imparted to the bunching-apron and is effected through the medium of a trip-arm 98^a, rigid with the shaft 66, said arm being provided at its outer end with an adjustable set-screw 99, which is adapted to engage with a lip 100 on the lower portion of the trip-plate. At the instant the bunching-roller reaches the limit of its rearward movement the trip-arm is raised a sufficient distance to bring the set-screw 99 into engagement with the lip, thereby throwing the trip-plate rearward and exerting a sudden tension or pull on the bunching-apron, which will cause the loop or pocket to be straightened out, and thus cause the discharge of the bunch. The provision of an adjustable set-screw is of importance, inasmuch as it will permit the operator to adjust the machine according to the size of the bunch—that is to say, a shorter vibration of the trip-plate will be required for a relatively small bunch than for a large one—and by adjusting the set-screw to cause it to engage the lip at the proper moment positive discharge of the bunch will always be secured.

Bunch-discharging mechanism.—When the bunch has been discharged from the apron in the manner required, it falls upon a plate 101, secured to a web 102, connecting the two arms 4 of the supporting-frame, and disposed above this plate the proper distance to permit passage between the two of the bunch is

a second plate 103, shorter than the first-named plate, the two plates constituting a discharge-chute. Coacting with the chute is a plunger or ejector 104, comprising a transverse head 105, which is of a width to span the discharge-chute, the head being carried by an arm 106, journaled at its lower end upon the pulley-shaft 26, the arm being provided with an elongated collar or bearing 107 in order to prevent vibrations which would interfere with the proper operation of this element. The arm is provided at its rear side with a cam-crotch 108, which is engaged by a roller 109, carried by an eccentric 110, mounted on the shaft 23, the lower member of the cam-crotch being provided with a lip 111, with which the roller initially engages upon the rotation of the shaft 23, thus to impart a rapid rearward movement to the plunger or ejector 104, the return movement of the ejector being effected through the medium of a spring 112, one end of which is secured to one member of the cam-crotch and the other end to the shaft 66. While this means of automatically returning the plunger or ejector to its normal position has been found thoroughly efficient in use, it is to be understood that the invention is not to be limited to this precise arrangement, as other devices may be employed for accomplishing the same result without departing from the spirit of the invention. As before pointed out, it is essential that after the cutting of the binder takes place a slight movement of the table shall be secured in order to move the binder forward a sufficient distance to effect application of the paste thereto, and this is effected through the medium of the eccentric 110, which engages a cam-crotch formed in the lower end of an arm 113, projecting downward from the standard or support of the bunching-table. The cam is so timed in its movement that rearward movement of the table does not begin until after the bunch has been discharged from the bunching-apron and forced rearward by the plunger or ejector, and after the knives have operated to sever the binder into the desired length the table then begins a slight rearward movement, imparting movement to the pasting-roller through an arc sufficient to apply the requisite amount of paste to the binder. In order to permit forward movement of the plunger or ejector through the requisite arc, the plate 101 is provided with a slot for this purpose.

Bunch rolling and compressing mechanism.—As before stated, after the bunch has been discharged from the bunch-making portion of the apparatus it is subjected to a prolonged rolling and compressing action, which operates not only to give a predetermined and proper shape to the bunches, but also to effect positive application of the binder thereto. The mechanism for effecting this result comprises a drum, Fig. 12, (designated generally

115,) carrying a plurality of rollers 116, disposed adjacent to its periphery and carrying each a gear 115^a. These rollers may be true cylinders, as where straight bunches are to be made, or may be concaved, as where regular cigar-shaped bunches are being made, as shown in Fig. 13. The drum comprises two heads 116^a and 116^b, which are supported upon a shaft 117; the body portion of the heads being approximately cone-shaped and their peripheries being disposed at right angles to the shaft 117 to provide appropriate bearings for the shafts of the rollers 116. The center portion of each of the heads is provided with a collar or hub 118, through which the shaft 117 passes, and the webs 117^a of the heads are held assembled by suitable bolts 119 and are held from lateral movement on the shaft by collars 117^b. Mounted upon the shaft 117 adjacent to one of the heads is a toothed disk 120, which is held against rotation by a screw 121, passing through one of the brackets 4 of the supporting-frame and into the disk. Motion is imparted to the drum 115 through the medium of a pawl 122, which is carried by the upper end of an arm 123, loosely mounted at its lower end on the shaft 117, the pawl being designed to engage teeth 124, formed in one of the heads of the drum intermediate of the rollers. The arm has connected with it one end of a link 125, the other end of which is fulcrumed at 126 to one of the rocking arms 65. As the rocking arms or bunch-roller-carrying frame is moved forward the pawl moves over the periphery of the head, with which it coacts, and imparts no motion to the drum; but as the rocking arms start to resume their normal positions the pawl will engage with one of the teeth 124, thereby rotating the drum and through the disk 120 and gears 115^a imparting motion to the entire series of rollers in a manner that will be obvious. In order that the rotation of the drum and of the rollers may be effective in causing compressing of the bunches, a belt 127 is provided, which entirely encircles the drum and has just sufficient slack to permit a fresh bunch to be forced in between the pocket between two of the rollers at the instant that a preceding bunch is discharged, it being a desideratum during the operation of the machine to have each of the pockets between the rollers from the point of entry to the point of discharge filled with a bunch, and as the bunch is forced into the pocket by the plunger or ejector 104 at the front side of the drum it follows that the latter will make practically a complete revolution before a bunch is discharged, thereby effecting the thorough compression of the bunch and certain application thereto of the binder in a manner that has before been described. To prevent bunching or gathering of the belt 127, a spring-support 128 is provided, over which the upper portion of the belt passes, the said

support being suitably secured to the bracket-arms 4 of the supporting-frame. Of course without the provision of some means for retaining the bunches in the pockets formed between each pair of rollers the discharge of the bunch will take place as soon as the drum has motion imparted to it, and to obviate this a shield or guard 129 is employed, one end of which is secured in any suitable manner between the lower plate 101 and the cross-bar to which it is secured. This shield or guard is of sufficient length to cause the bunches to be retained within the rollers until the drum has made about three-fourths of a revolution, more or less, and to prevent the tension of the shield or guard from having any destructive effect on the bunches the same is provided with spring-terminals 130, carried by a bar 131, secured to the end of the shield, the ends of the springs being connected in any suitable manner to the spring-support 128. It will of course be obvious that the shield or guard may be of such length as to permit the discharge of the bunches at the lower side of the drum or any other point in its circumference, and for this reason it is to be understood that the invention is not to be limited to the arrangement shown.

All of the parts of the machine, as described, are constructed with a view to certainty of operation and prolonged use without danger of derangement, and the operations are so timed that any attention on the part of the operator other than to supply the fillers is rendered entirely unnecessary.

After the bunching-roller has resumed its normal position it is essential that it should remain at the point to which it is moved until the machine is operated, as if it is moved away from this position the timing of the different parts of the apparatus will be destroyed and the proper formation of the bunch and the application thereto of the binder will be prevented. To prevent any disarrangement in the timing of the parts, the bunching-roller is positively locked against rearward movement through the agency of a dog 132, secured to the side of the frame and having its lower end disposed upon the rim of the disk 22, which is provided with a notch or recess 133 to be engaged by the dog. In the event that a workman carelessly takes hold of the bunching-roller and draws back upon it the dog 132 will positively prevent any movement of the disk, so that the proper timing of all of the parts will be maintained.

The operation of the machine is as follows: The parts being shown in Fig. 2 with a previously-severed binder disposed over the pocket between the bunching-roller and the table, the operator places the filler within the pocket and trips the dog 44. As soon as the clutch mechanism is released to lock the gear 24 upon its shaft forward movement of the

bunching-roller takes place, effecting rolling of the bunch and application of the binder thereto, this motion being continued until the bunch reaches the end of the table, whereupon the trip-plate is actuated in the manner described, causing the bunch to be deposited within the chute or upon the plate 101. During this operation the knives and paste-cup are raised and a predetermined length of binder is fed forward to the position to be severed when the knives shall again have resumed their normal position. At the instant that the bunch is discharged from the bunching-apron the plunger or ejector is actuated and forces the bunch through the discharge-chute and in between a pocket formed by the belt 127 in conjunction with two of the rollers 116 of the drum. In the return movement of the bunching-roller the bunching-table is moved rearward through a short arc and remains in this position until the bunching-roller practically reaches the limit of its return stroke, whereupon the eccentric 110 is brought into play and moves the table forward, thereby imparting a slight movement to the binder and causing application thereto of paste. The rocking arms 65 then move rearward a short distance and form the filler-receiving pocket between the bunching-table and the bunching-roller, and the machine is then ready to receive another bunch. At the instant that the bunching-roller resumes its normal position the clutch mechanism is thrown out of operation by the arm 42 being engaged by the dog 44 in the manner already described.

While the cutting mechanism is herein shown as combined with the pasting mechanism—that is to say, the upper cutting-blade—it will be obvious that, if preferred, an independently-operating blade may be employed, which may have either a vertical reciprocatory or a shearing motion imparted to it. Furthermore, it is to be understood that the form of bunch carrying and rolling drum herein shown may be changed as to structure—that is to say, instead of having the heads approximately cone-shaped, as shown, they may be ordinary flat disks, and as this will be apparent detailed illustration is not thought to be necessary.

Having thus described the invention, what I claim is—

1. In a cigar-bunching machine, mechanism for presenting a continuous web of tobacco, means for automatically separating the web into binders of predetermined lengths, bunch-making mechanism embodying an oscillatory bunch-making table to receive the binder, means to oscillate the table and means actuated by the oscillations of the bunch-making table to apply an adhesive to the binder.

2. In a cigar-bunching machine, means for supporting a roll, web or sheet of binders,

means for feeding the binders through the machine, and pressure mechanism coacting with the binders embodying a plurality of independently-yieldable rollers.

3. In a cigar-bunching machine, mechanism for presenting and feeding a roll, web or sheet of binders through the machine, and pressure-exerting mechanism coacting with the binders embodying a shaft, and a plurality of rollers mounted upon the shaft and vertically yieldable thereon independent of each other.

4. In a cigar-bunching machine, mechanism for presenting and feeding a roll or web of binders, means for feeding the binder through the machine, a bunch-making table, paste-applying mechanism, and means for imparting a slight oscillation to the bunch-making table to effect application of the paste to the binder.

5. In a cigar-bunching machine, a strip of fabric designed to inclose a web or sheet of binders, means for feeding the binders through the machine and for separating them in predetermined lengths, paste-applying mechanism, and means for stripping the binder from the fabric.

6. In a cigar-bunching machine, the combination with a strip of fabric designed to inclose a web, roll or sheet of binders, of mechanism for cutting the binders into predetermined lengths, paste-applying mechanism, and means for separating the elements of the cutting mechanism to prevent the binders from adhering thereto.

7. In a cigar-machine, a bunch-making table, a bunching-apron, means for feeding binders to said apron, means for applying paste to the binders, a bunching-roller, a pivoted plate to which one terminal of the apron is secured, and means for tripping the plate at the limit of the forward stroke of the bunching-roller, thereby to straighten out the apron and effect discharge of the bunch.

8. In a cigar-bunching machine, the combination with bunch-making mechanism, of means for compressing and rolling the bunches, comprising a plurality of rollers, a belt to hold the bunches between the rollers, and means to permit the belt to yield to compensate for variation in the sizes of the bunches.

9. In a cigar-bunching machine, a bunch compressing and shaping mechanism comprising a plurality of driven rollers, a belt to hold the bunches between the rollers, and a shield or guard partially encircling said mechanism and yieldable to prevent injury to the bunches.

10. In a cigar-bunching machine, a bunch compressing and shaping mechanism comprising a plurality of driven rollers, a belt to hold the bunches between the rollers, and a yieldable shield or guard partially encircling the mechanism.

11. In a cigar-bunching machine, a bunch carrying and rolling device embodying a plurality of rollers, a belt forming pockets between the rollers to receive the bunch, a shield or guard partially encircling the mechanism, and means for yieldingly and detachably connecting the shield or guard with the machine.

12. In a cigar-bunching machine, a bunch carrying and rolling drum embodying a pair of heads, rollers carried by the heads and provided each with a gear, a toothed fixed disk meshing with the gears, means for imparting a step-by-step motion to the drum to cause turning of the rollers, a belt encircling the drum, and a shield or guard partially encircling the drum.

13. In a cigar-bunching machine, bunch-making mechanism, a bunch carrying and rolling drum, a belt encircling the drum and held in yielding relation therewith, a chute to receive the bunches from the bunch-making mechanism, and means coacting with the chute to form a pocket in the belt and to deposit the bunch therein.

14. In a cigar-bunching machine, mechanism for presenting and feeding a web, sheet or roll of binders, compressing, cutting and pasting mechanism, bunch-making mechanism, a bunch carrying and rolling element, and means for forcing a bunch from the bunch-making mechanism to the bunch carrying and rolling element.

15. In a cigar-bunching machine, a binder-compressing, cutting and pasting mechanism, bunch-making mechanism, means for elevating the compressing, cutting and pasting mechanism during the operation of the bunch-making mechanism, and means for cushioning the descent of the compressing, cutting and pasting mechanism.

16. In a cigar-bunching machine, the combination with bunch-making mechanism, of a rolling and compressing drum including an encircling belt yieldably supported with relation to the drum, means for transferring a bunch from the bunch-making mechanism to the drum and for forming a pocket within the belt, and means coacting with the belt to hold the bunches within the pockets.

17. In a cigar-bunching machine, a bunch-making table, a bunching-apron and a bunching-roller coacting therewith, paste-applying mechanism and means for imparting a slight oscillatory movement to the bunching-table to cause proper application of the paste to a binder.

18. In a cigar-bunching machine, the combination with mechanism for presenting and feeding a web or roll of binders, embodying a strip of fabric between which the binders are included, of means for stripping the binders from the fabric, means for exerting pressure on the binders, means for cutting the binders

into predetermined lengths, and means for applying an adhesive thereto.

19. In a cigar-bunching machine, the combination with bunch-making mechanism, of a bunch rolling and compressing mechanism embodying an endless belt and means for transporting the bunches from the bunch-making to the bunch rolling and compressing mechanism and for forming pockets within the belt for receiving the bunches.

20. In a cigar-bunching machine, the combination with binder-feeding, bunch-making and bunch rolling and compressing mechanism embodying a plurality of rollers and a belt encircling the same, of actuating mechanism therefor embodying a positively-driven gear, clutch mechanism for locking the gear upon the shaft, and a trip-lever for controlling the operation of the clutch mechanism.

21. In a cigar-bunching machine, a bunch rolling and compressing drum, means for imparting a step-by-step movement thereto, a belt encircling the drum and having yielding connection therewith, a shield or guard partially encircling the drum, and resilient connections between the free end of the shield or guard and the machine.

22. In a cigar-bunching machine, the combination with a bunch-making table, of a bunching-apron and bunching-roller, means for feeding binders to the bunching-apron, means for applying paste to said binders, and means for exerting tension on the bunching-apron when the formation of a bunch is completed thus to insure its proper discharge.

23. In a cigar-bunching machine, the combination with bunch-making mechanism, of binder feeding, cutting and pasting mechanisms, means for elevating the latter mechanism during the operation of the bunch-making mechanism, and means for gradually returning the said mechanisms to their normal position.

24. In a cigar-bunching machine, a frame supporting a roll or web of fabric and adapted to have tobacco included in its plies, means for cutting the tobacco into predetermined lengths, means for applying an adhesive to the tobacco, bunch-making mechanism, and means for moving the frame, cutting and paste-applying mechanisms to and from the bunch-making mechanism.

25. In a cigar-bunching machine, a frame supporting a roll or web of fabric, means carried by the frame for cutting the tobacco into predetermined lengths, means for applying an adhesive to the tobacco, oscillatory bunch-making mechanism, and means for moving the frame, cutting and paste-applying mechanisms to and from the bunch-making mechanism.

26. In a cigar-bunching machine, a bunching-table, paste-applying mechanism, and means for applying a slight oscillatory mo-

tion to the table to cause the paste-applying mechanism to perform its function.

27. In a cigar-bunching machine, the combination with mechanism for presenting and feeding a continuous web of tobacco, and bunch-making mechanism coacting therewith, of bunch rolling and compressing mechanism embodying a plurality of driven compressing elements, a belt, and means for holding the bunches within the pockets formed by the belt between the compressing elements.

28. In a cigar-bunching machine, the combination with mechanism for presenting and feeding a continuous web of tobacco, of means for severing the web into predetermined lengths and for applying an adhesive thereto comprising a frame embodying an under knife, an upper knife supporting a paste-cup and a paste-applying roller, means for bodily lifting the frame, and means for separating the members of the knife.

29. In a cigar-bunching machine, mechanism for presenting a continuous web of tobacco, a bunch-making table, and means for oscillating the same, and mechanism for severing predetermined lengths of tobacco from the web and for applying a paste thereto comprising two knives, one of which is movable with relation to the other, a paste-cup carried by one of the knife-supports, and a corrugated paste-applying roller carried by the cup.

30. In a cigar-bunching machine, a bunch carrying and rolling drum embodying a plurality of rollers, each provided with a gear, a fixed toothed disk meshing with the gears, and means for imparting motion to the drum to cause turning of the rollers.

31. In a cigar-bunching machine, a bunch carrying and rolling drum embodying a plurality of rollers each provided with a gear, a fixed toothed disk meshing with each of the gears, and means for imparting step-by-step motion to the drum to cause turning of the rollers.

32. In a cigar-bunching machine, a bunch carrying and rolling drum embodying a plurality of rollers each provided with a gear, a fixed toothed disk meshing with each of the gears, means for imparting a step-by-step motion of the drum to cause turning of the rollers, a belt encircling the drum, and a shield or guard partially encircling the drum.

33. In a cigar-bunching machine, a bunching-table, paste-applying mechanism, means for oscillating said mechanism, and means for imparting an oscillatory motion to the table to cause the paste-applying mechanism to perform its function.

34. In a cigar-bunching machine, a bunch rolling and compressing drum, means for imparting movement thereto, an endless apron of greater diameter than that of the drum, automatically-operating means for taking up the slack of the apron, and a shield or guard

partially surrounding the drum and coacting with the belt.

35. In a cigar-bunching machine, bunch-making mechanism, a bunch carrying and rolling drum including an endless apron, and an oscillatory plunger for conveying a bunch from the bunch-making mechanism and forcing it into a pocket formed by the belt.

36. In a cigar-bunching machine, a binder compressing, cutting and pasting mechanism, bunch-making mechanism, means for elevating the compressing, cutting and pasting mechanism during the operation of the bunch-making mechanism, and a vibratory lever provided with means for engaging a part of the compressing, cutting and pasting mechanism to check its descent.

37. In a cigar-bunching machine, the combination with bunch-making mechanism and a rolling and compressing drum, of a plate supported by a fixed part of the machine, and adapted to receive the bunch when discharged from the bunch-making mechanism, an oscillatory plunger coacting with the plate to force the bunch to the rolling and compressing mechanism.

38. In a cigar-bunching machine, a bunching-apron, a bunching-roller coacting therewith, a pivoted plate to which one end of the apron is secured, a spring engaging said plate and an oscillatory lever adapted to contact with the plate to move said pivoted plate against the tension of the spring cooperating therewith and effect stretching of the apron at the limit of the operative stroke of the bunching-roller, to effect discharge of a bunch.

39. In a cigar-bunching machine, a bunching-apron, a bunching-roller coacting therewith, a pivoted plate to which one end of the apron is secured, and an oscillatory lever adapted to contact with the plate to effect stretching of the apron at the limit of the operative stroke of the roller, said lever being provided with adjustable means whereby to vary the throw of the plate.

40. In a cigar-bunching machine, the combination with mechanism for presenting and feeding a continuous web of tobacco, of means for severing the web into predetermined lengths comprising a frame embodying an under knife and an upper knife, means for bodily lifting the frame, and means for separating the members of the knife.

41. In a cigar-bunching machine, the combination with mechanism for presenting and feeding a continuous web of tobacco, of means for severing the web into predetermined lengths comprising a frame embodying an under knife and upper knife, means for bodily lifting the frame, means for separating the knife members, and paste-applying mechanism actuated by the upper knife.

42. In a cigar-bunching machine, a bunch rolling and compressing drum, means for im-

parting movement thereto, an endless apron of greater diameter than that of the drum, automatically-operating means for taking up the slack of the apron, and a yielding shield or guard partially surrounding the drum and coacting with the belt.

43. In a cigar-bunching machine, a bunch carrying and rolling drum including an endless apron, an oscillatory plunger for conveying a bunch from the bunch-conveyer mechanism and forcing it into a pocket formed by the belt, and a shield or guard operating to hold the bunches in the pockets thus formed.

44. In a cigar-bunching machine, a binder cutting and pasting mechanism, bunch-making mechanism, means for lifting the cutting and pasting mechanisms during the operation of the bunch-making mechanism, and means for cushioning the descent of the cutting and pasting mechanisms.

45. In a cigar-bunching machine, the combination with bunch-making mechanism and a rolling and compressing drum, of means to receive a bunch when discharged from the bunch-making mechanism, and oscillatory mechanism to force the bunch to the rolling and compressing mechanism.

46. In a cigar-making machine, the combination with means for supporting a web of tobacco, means for cutting such web into wrappers, bunch-forming mechanism, bunch rolling and compressing mechanism, and means for transferring the bunches from the bunch-forming to the bunch rolling and compressing mechanism, substantially as described.

47. In a machine for manufacturing cigars, the combination with means for supporting a web of tobacco, means for severing the web into wrappers, paste-applying mechanism, bunch-forming mechanism, bunch rolling and compressing mechanism, and means for transferring the bunch from the forming to the rolling and compressing mechanism, substantially as described.

48. In a machine for manufacturing cigars, the combination with means for supporting a web of tobacco, means for severing the web into wrappers, means for applying paste to the wrappers, a bunch-forming mechanism

comprising a table, a table-traversing roll, and an apron, bunch rolling and compressing mechanism, means for dislodging a bunch from the forming mechanism, and means for transferring a bunch from the forming to the rolling and compressing mechanism, substantially as described.

49. In a cigar-making machine, the combination with means for supporting a web of tobacco, means for severing the web into wrappers, pasting mechanism bunch-forming mechanism comprising a table, a traversing roll and an apron, means for lifting the bunch severing and pasting mechanism to permit operation of the traversing roll, means for feeding the web to the severing mechanism and apron, means for dislodging a bunch from the bunch-forming mechanism, bunch rolling and compressing mechanism, means for actuating said latter mechanism, and means for transferring a bunch from the forming to the rolling and compressing mechanism, substantially as described.

50. In a cigar-bunching machine, a frame designed to support a plurality of rollers, a roll of fabric carried by one of the rollers and designed to inclose a web, roll or sheet of binders between its plies, a second roller on which the free end of the fabric is wound, a drum in contact with the fabric, and means for imparting motion to said drum to cause the unwinding of the fabric and the presentation of the binders.

51. In a cigar-bunching machine, a vibratory frame carrying a plurality of rollers, a strip of fabric wound upon one roller and adapted to have tobacco included in its plies, the free end of the fabric being wound upon the other roller, a drum in contact with the fabric, and means for imparting a step-by-step motion to the drum to effect the unwinding of the fabric from the first-named roller and its storage upon the second-named roller.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALFRED S. KOCH.

Witnesses:

R. M. ELLIOTT,
W. H. CLARKE.