

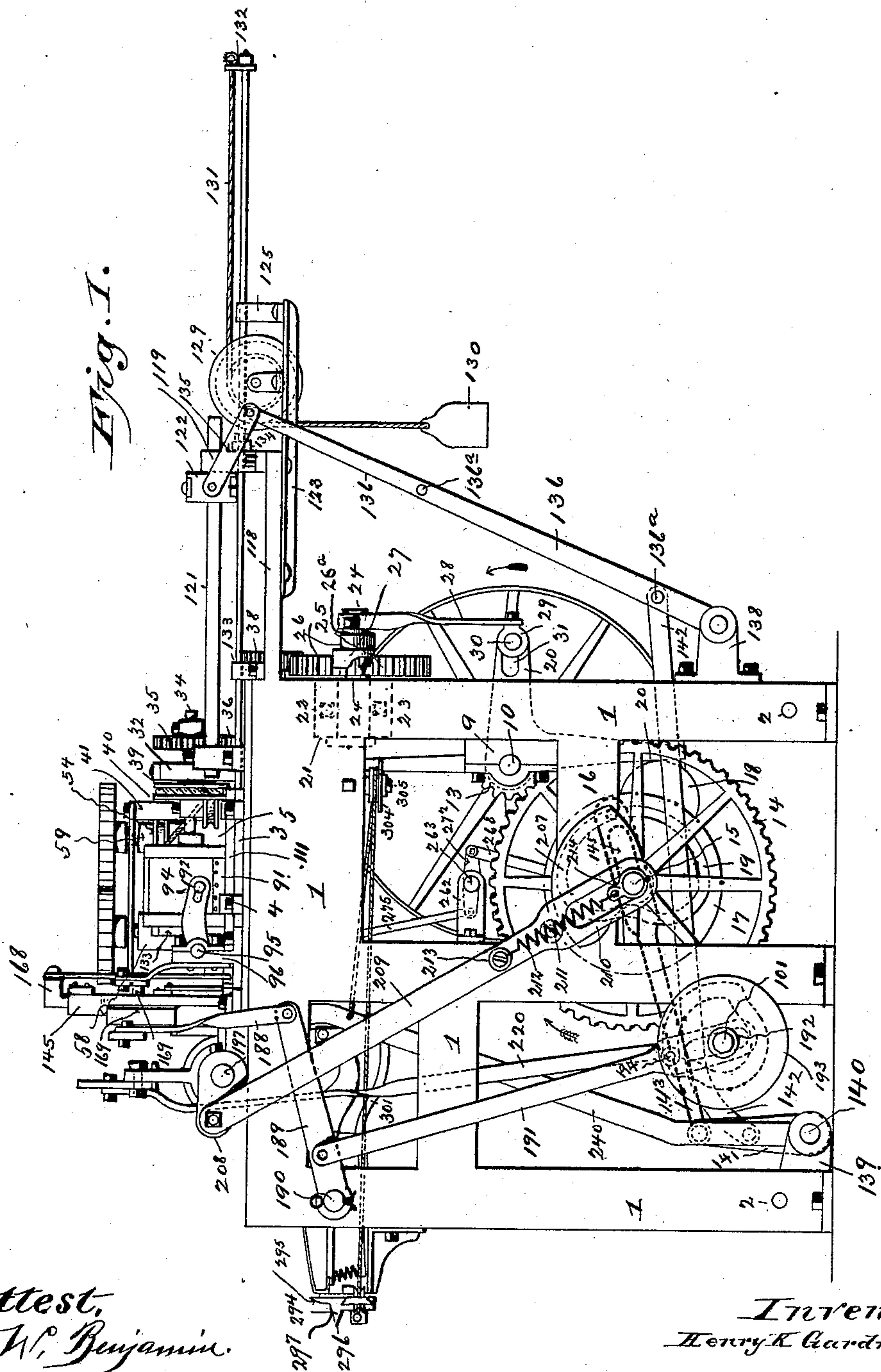
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7 Sheets—Sheet 1.

H. K. GARDNER.  
CIGAR BUNCHING MACHINE.

No. 528,903.

Patented Nov. 6, 1894.



Attest,  
C. W. Benjamin.  
M. F. Daly

Inventor,  
Henry K. Gardner  
by Joseph R. Levy  
atty

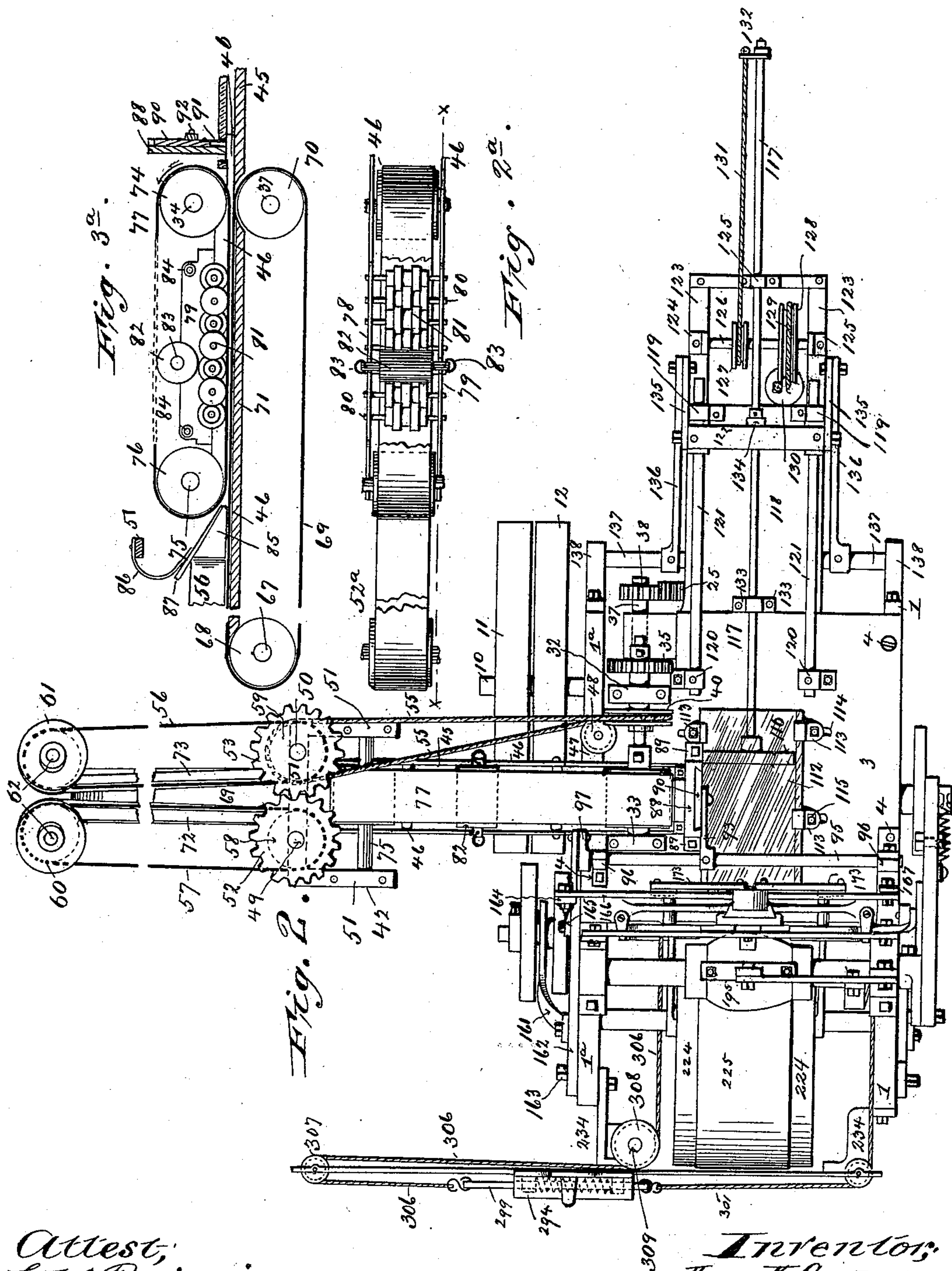
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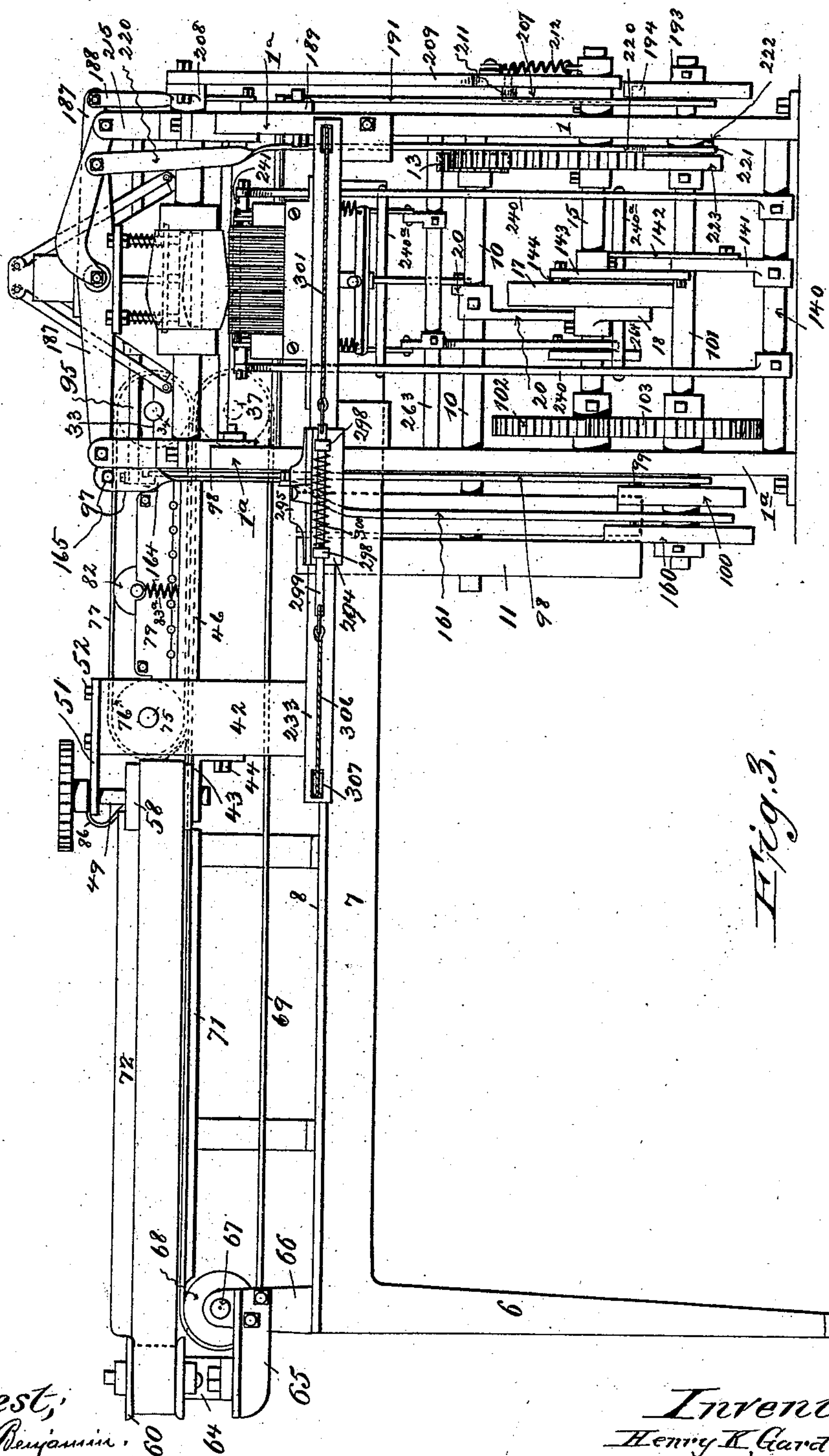


Fig. 3.

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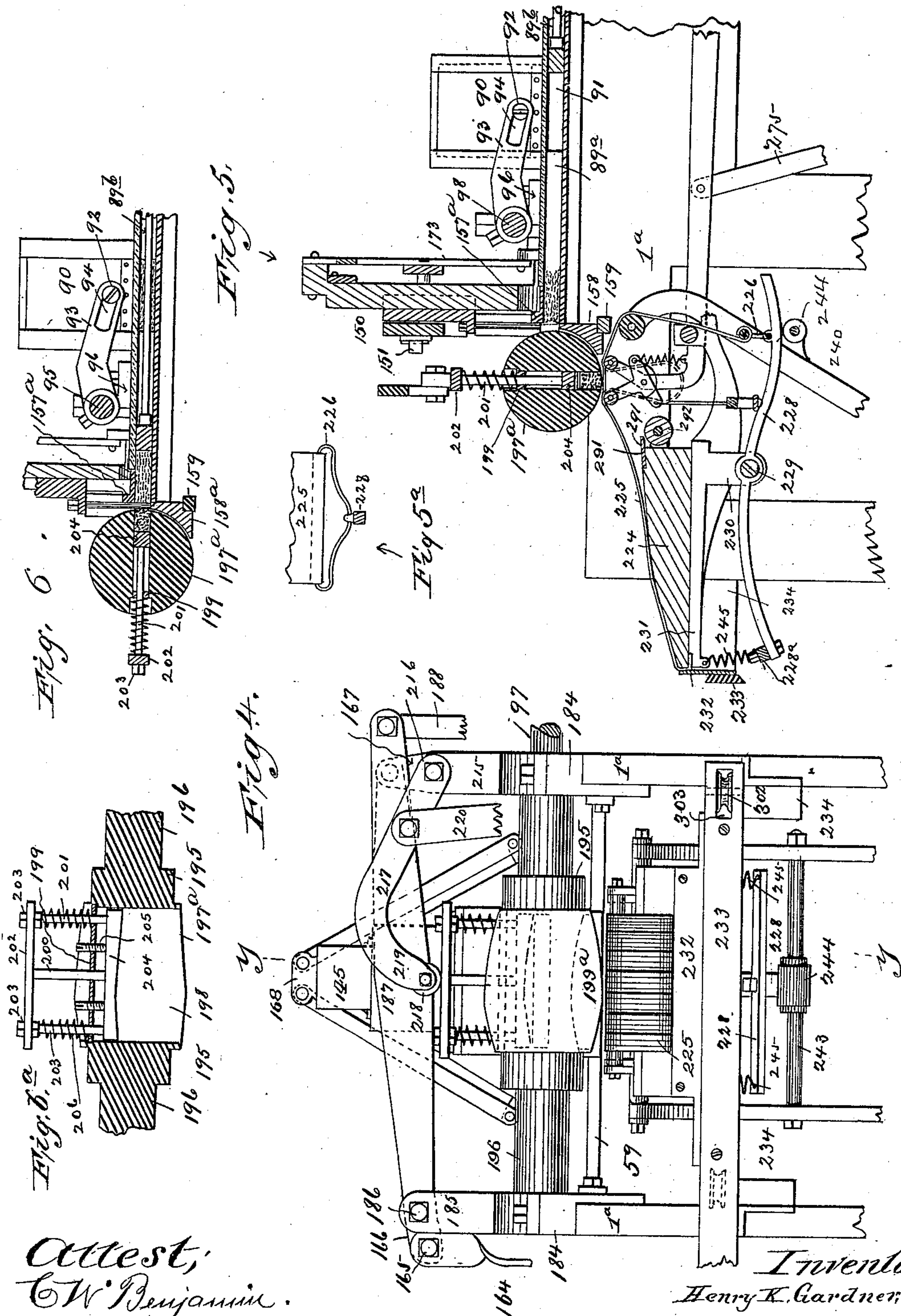
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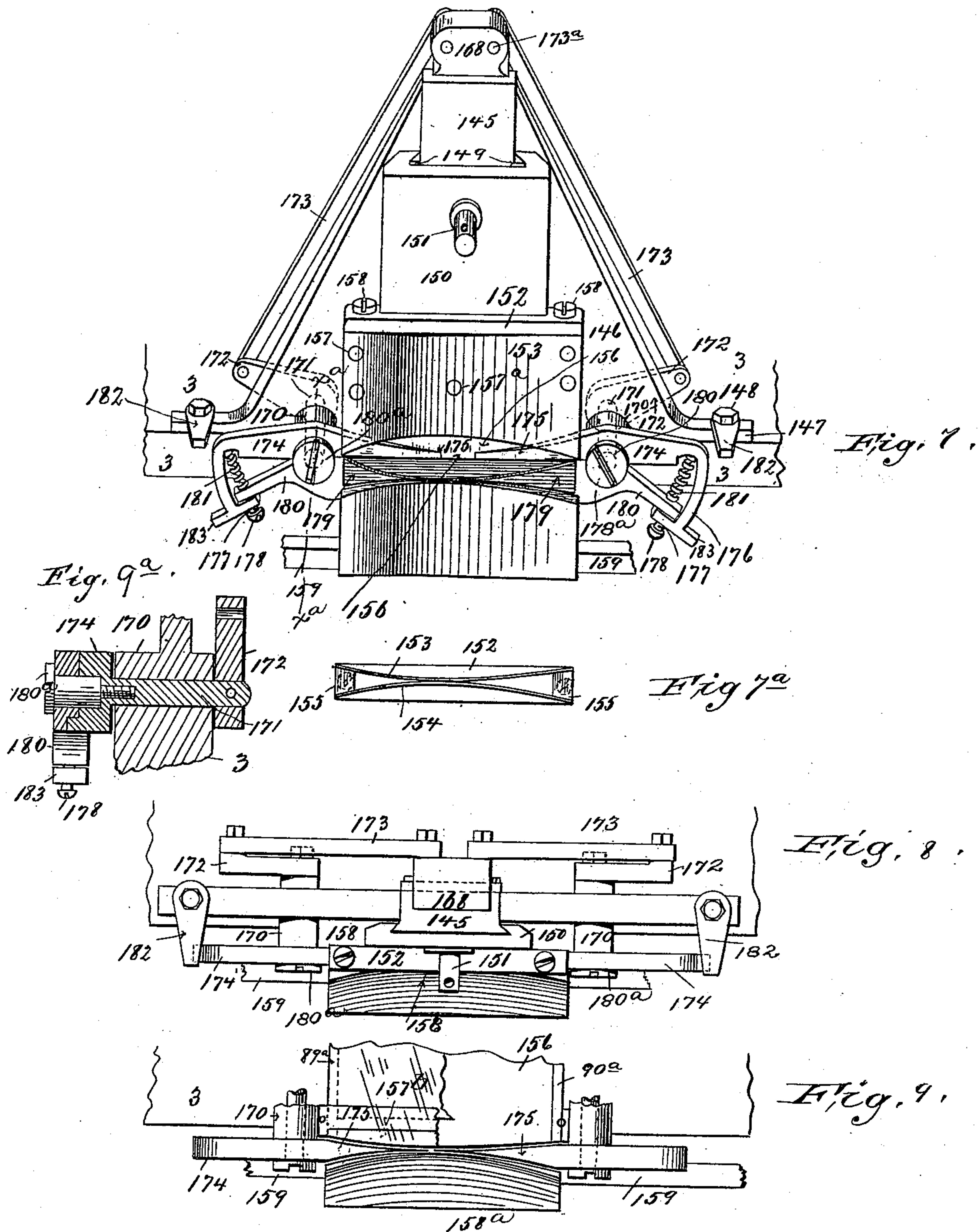
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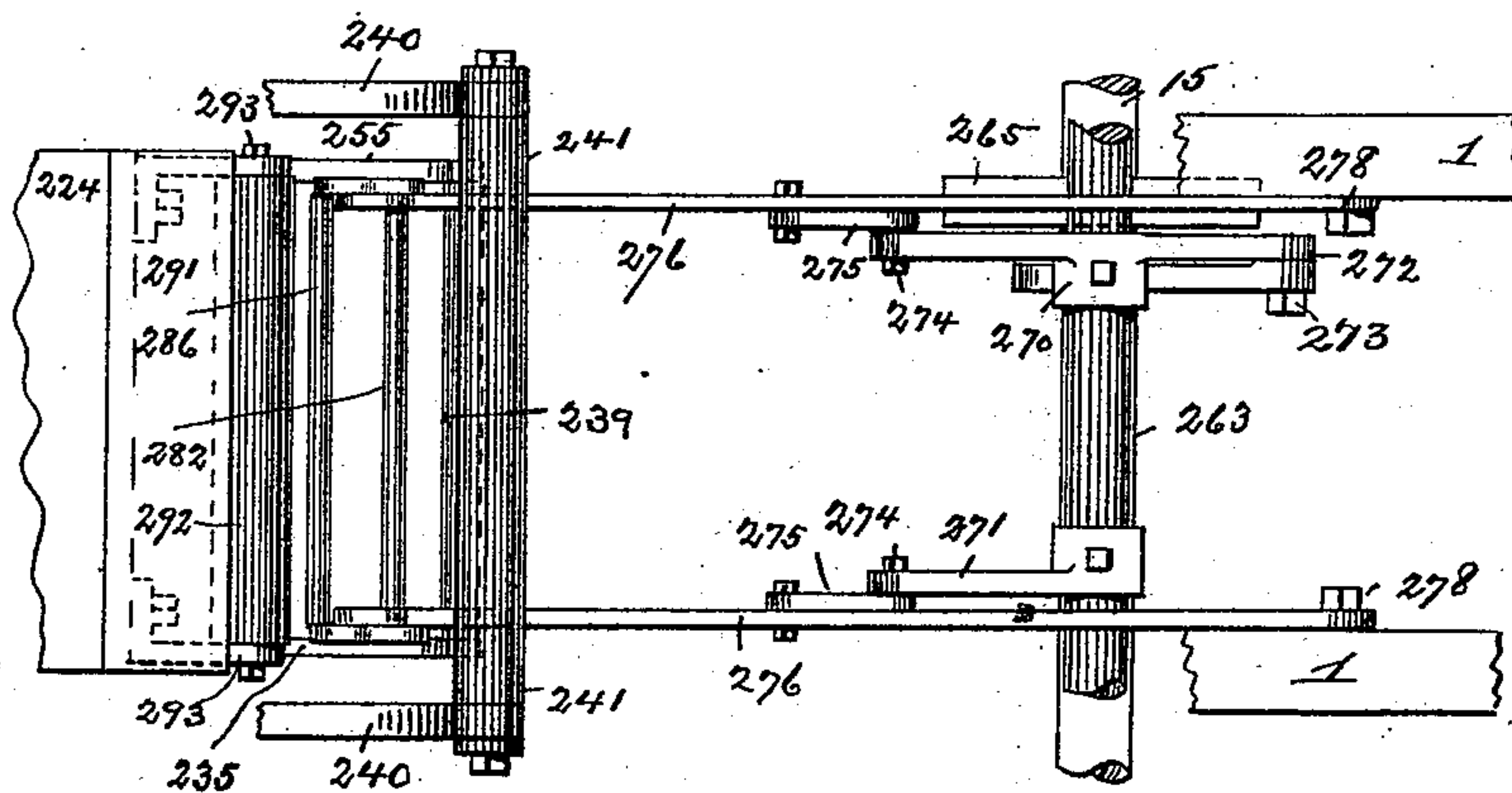
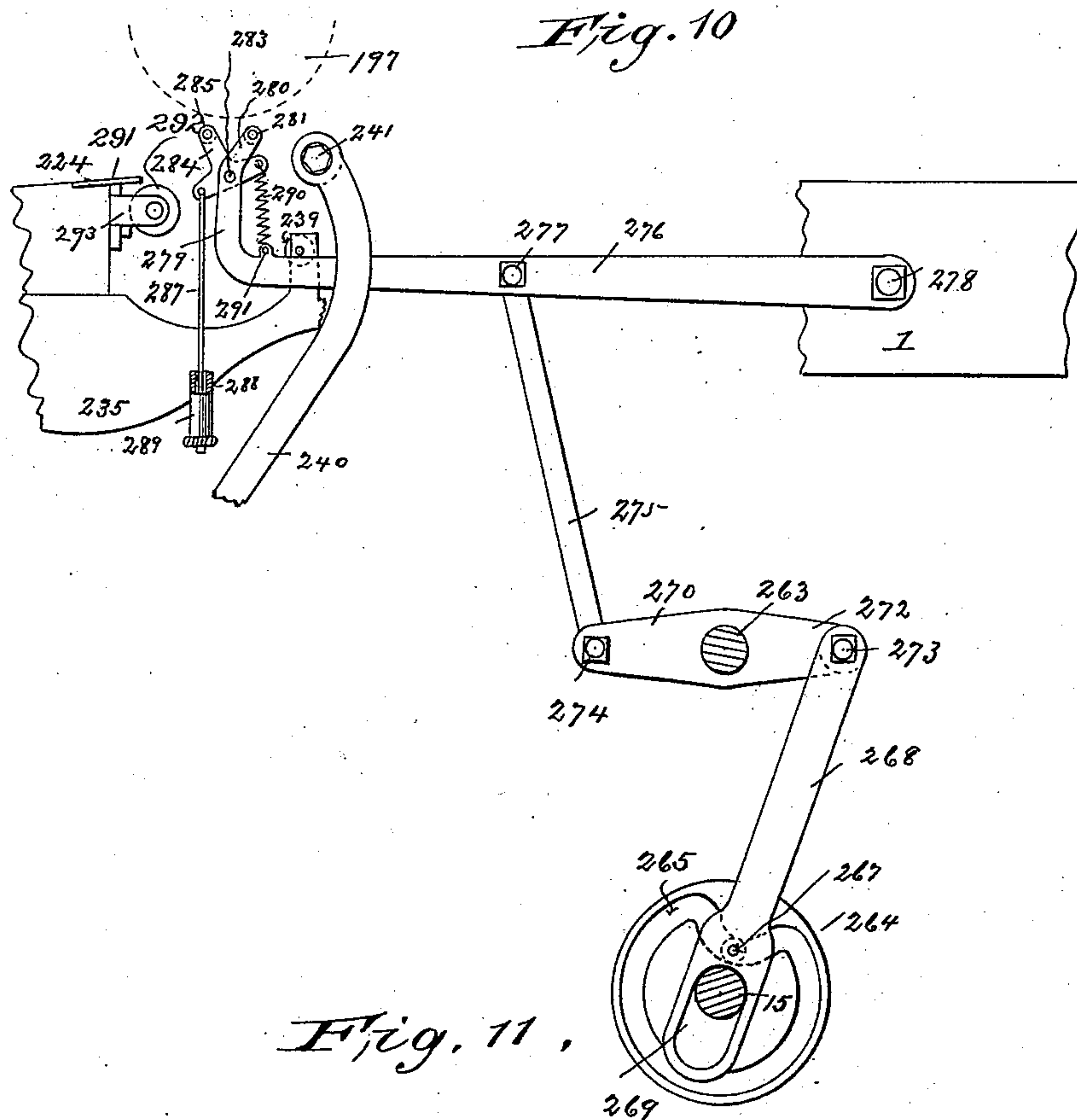
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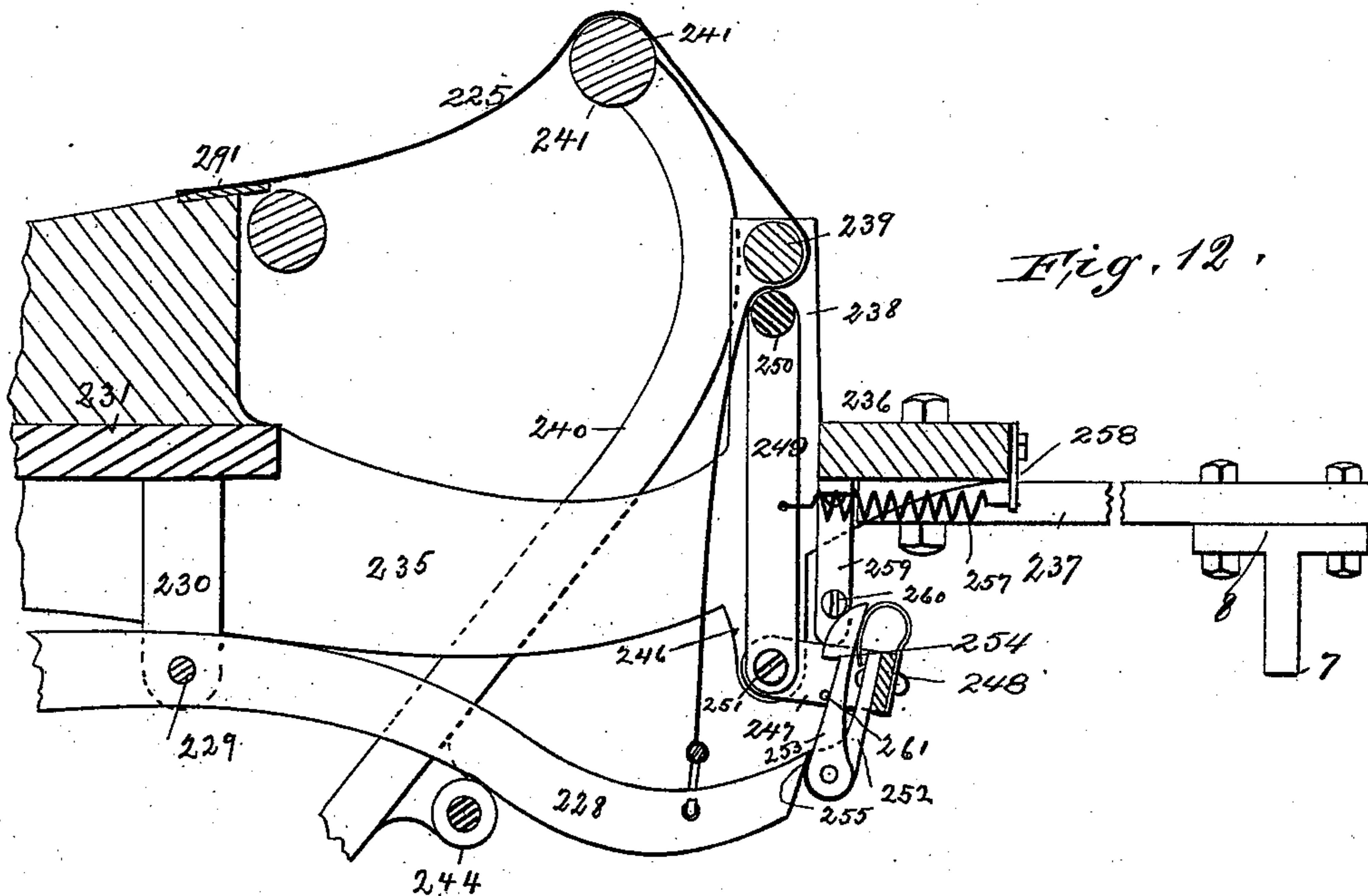


Fig. 12.

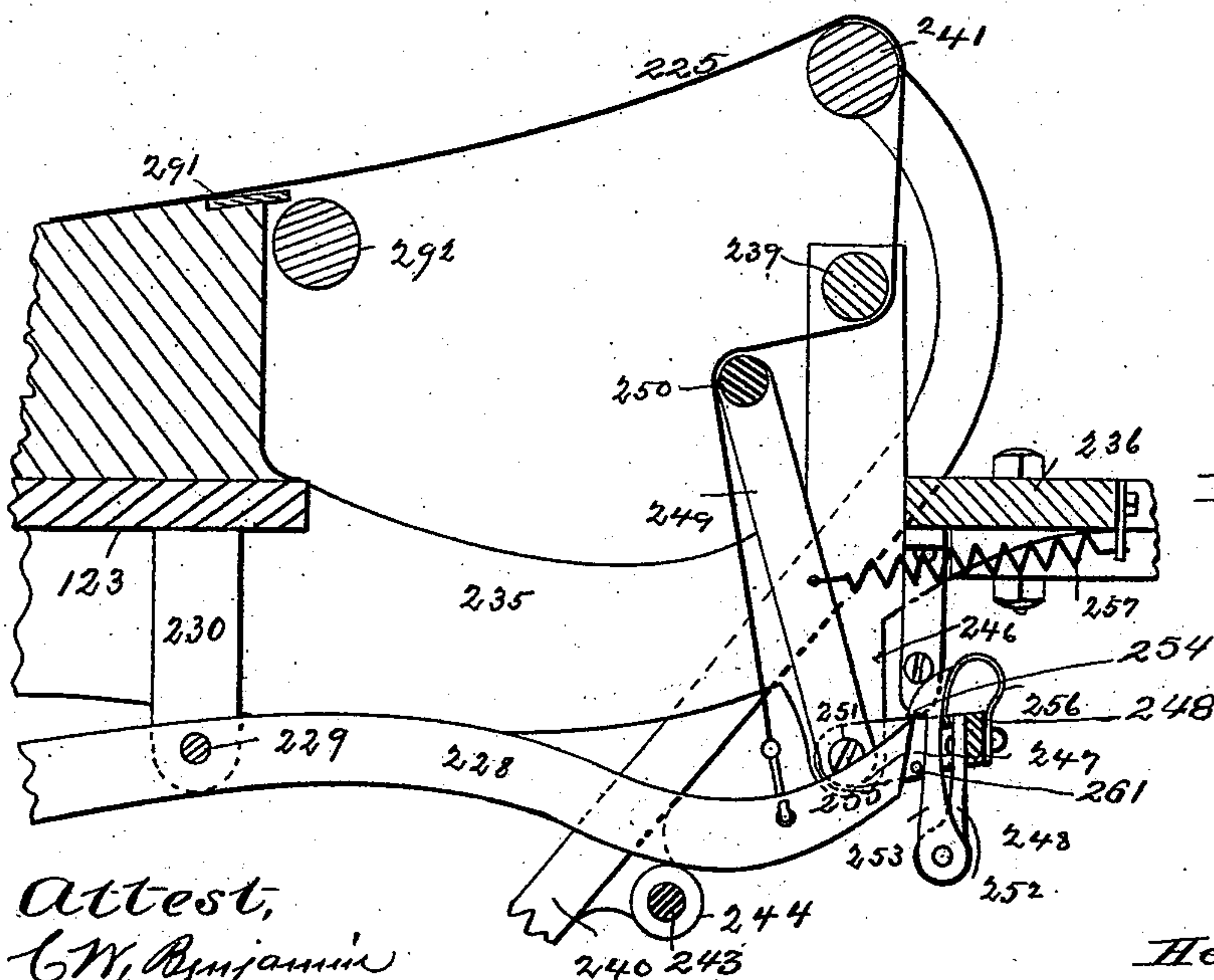


Fig. 13.

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# UNITED STATES PATENT OFFICE.

HENRY K. GARDNER, OF PAWTUCKET, RHODE ISLAND.

## CIGAR-BUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 528,903, dated November 6, 1894.

Application filed July 25, 1893. Serial No. 481,400. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY K. GARDNER, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have made certain new and useful Improvements in Cigar-Bunching Machines, of which the following is a specification.

My invention relates to that class of machines wherein the entire stripped leaf is utilized for the purpose of making cigar bunches as distinguished from those wherein scrap or short tobacco is used.

My invention contemplates the use of stripped tobacco leaf, of full length, which is fed into the machine in an unbroken stream, as distinguished from using long filler when the same consists in breaking the leaf to make it fit either some measuring device or the hand.

My invention also contemplates a process of making or producing a filler for a bunch, which I believe to be entirely new with me.

In describing my invention I shall commence at the point where the leaf is first manipulated, but in doing so it is not my intention to make the parts first described of greater importance than those which follow, as they may be of less importance.

The first part of my invention relates to the arrangement of the feeding mechanism and the booking of the leaf, and under this head the invention consists of a trough formed or defined by a plurality of moving belts, each one drawing the leaf along, which trough begins with a narrowed or contracted section and terminates in a spring pressed ironing mechanism which flattens out or irons each strip of tobacco leaf to the end that each leaf is caused to lay straight and even, rendering the resultant cigar free in draft.

The second part of my invention relates to a transferring device, which, in combination with a suitable cutting device, and a plunger which is placed under pressure to determine the amount of tobacco or filler which is to enter into the bunch, the plunger working in a throat which receives the severed charge and prevents it from spreading, and a forming knife or contour cutter, comprises means whereby a suitable amount of the leaf is cut to give length to the filler, the severed charge

then being moved toward the forming knife or contour cutter by a plunger which is regulated to accommodate itself in such a way that it will only pass or convey to the forming knife just a sufficient amount of previously severed charge, and which has previously been determined upon for the proper weight and size of the resulting bunch.

The next combination or distinctive part of my invention resides in what I call an oscillatory transferer and ejector. This is located directly in front of the forming knife and throat, is mounted in suitable bearings, and is connected with means for giving it an oscillatory movement. It lies above the rolling table and that part which moves in front of or in contact with the forming device has substantially the same contour as the exterior of the cigar to be produced, or a section thereof. The oscillatory transferer is provided with a pocket, so called, which is adapted to receive one side or end of the charge fed through the throat, under the knife, and into the pocket, the rear of the pocket being formed by a movable plunger which brings up against an adjustable abutment, the operative surface of the plunger being shaped reversely to the outer edge of the pocket, so that the pocket will accord with the shape of the forming knife and hold the conformed charge without compression. Means are provided for ejecting the charge from the pocket at the proper time; and a stationary abutment, shaped to the surface of the oscillatory transferer, and against which it moves, prevents the charge leaving the pocket until freed by the plunger. The ejector also comprises means for limiting the amount of retraction of the plunger, so as to regulate the diameter or density of the bunch by causing it to recede farther from the periphery of the oscillatory transferer, increasing or decreasing the containing capacity of the pocket, and causing the charge to be made larger or smaller as the necessities of the case require. The throat plunger at all times being adapted to exert only a certain amount of pressure upon the column of tobacco being fed toward the forming knife, will force just so much tobacco into the pocket as will fill it without undue compression or crowding. Thus the power of the throat plunger, which



is variable, determines the quantity of tobacco to be moved into the pocket, and by varying the weight attached to the plunger the density of the bunch is regulated. The forming knife further comprises means for shaping the charge so that its forward edge will fit the shaped surface of the ejector plunger and at the same time give to the other edge of the charge the proper conformation, so that the resultant charge which is finally ejected into the rolling apron forms in exterior outline approximately the shape of the cigar to be produced, and this is accomplished without forcing or compressing the filler together to get this conformation, it being formed by cutting or shaping the charge in contradistinction to pressing it into the desired shape, and this is accomplished prior to the rolling of the filler into the binder. In this regard it might be well to state that with the forming knife I provide two independent ejectors which eject the gore of tobacco left by the opposing knives and between them.

The object of the mechanism thus briefly stated is to first drive or move into the mechanism for forming the bunch a continuous stream or line of stripped leaf, not previously cut, and in a loose and unconfined condition, first to a device which will iron out, or, in other words, slightly compact and flatten out the leaves and arrange them as nearly horizontal to each other as may be had by mechanism, this operation having as its desired end the imitation of the operation of placing the filler in the hands of an operator, with the addition of giving a continuous supply of such filler to that part of my machine which operates to substitute the manual act of placing the tobacco in the hand for the purpose of forming the bunch; second, the filler is cut or severed to the desired length, which obviates the waste which is usually brought about in hand work by the workman breaking off the ends or cutting the ends after the bunch is formed, the knife being so timed with relation to the travel of the leaf through the ironing mechanism that it will sever the stream of advancing leaves so that each will be proportionate or equal to the length of the cigar desired. This severance takes place after the leaf has entered the throat which is adapted to be adjusted to receive the varying length of the charge fed into it through a variable feed mechanism; third, the throat plunger moves the charge in the throat, the forward edge of the charge entering the pocket in the oscillatory transferrer, and a portion of the charge lying in the throat it is firmly held until the forming knife has severed a sufficient quantity, this being determined by either the pressure on the throat plunger or by the size of the pocket. The measured charge now having been conformed it is conveyed to the rolling mechanism where a binder is placed about the charge.

The next part of my invention comprises a device which is an adjunct to the rolling table

hereinafter to be described whereby a pouch is automatically formed in the rolling apron to receive the charge from the oscillatory transferer, the jaws of the pouch forming a device gripping the charge of filler and confining it in such a way as to preserve its compactness until the apron has been moved forward, and forming a bight wherein the charge lays, the apron during its forward movement lifting the charge out from the jaws and enveloping it until such time as it reaches the binder which is rolled about the charge in the usual manner. This part of my device also comprises means for distributing the slack in the apron so that the pouch is readily formed.

The rolling means, which forms the next portion of my invention, comprises a carrying table disposed in the segment of a circle and a vibratory arm carrying a bunching roller which engages with a rolling apron, the apron being fast at both ends.

I also provide a reciprocating carriage, so operated that it will be in front of the rolling table at the time when the bunch reaches the end of its travel, a spring clip on the carriage grasping the bunch, the carriage then being moved to a desirable distance away from the rolling table and there removed by a second operator who places the bunch within the proper form or mold, the carriage then being moved back in proper time to receive the next bunch from the rolling table.

My invention further includes other points of novelty hereinafter specifically set forth, all of which will be further pointed out in the claims.

In the drawings forming part of this application: Figure 1 is a side elevation of the machine, the position of the parts of the machine in this view indicating that a desired length of filler has been cut and fed into the oscillating transferrer, the throat plunger has been receded, awaiting the presentation of a new length of filler, the pouch forming mechanism being in a position to receive the charge from the transferrer, the rolling mechanism in a position ready to receive the charge from said pouch, and the reciprocating carrier moving toward the front of the rolling table to receive the rolled bunch. Fig. 2 is a plan view of Fig. 1 with the parts approximately in the same position, the feeding trough being foreshortened to show the end of same and preserve the size of the parts. Fig. 2<sup>a</sup> is a plan view of the ironing mechanism enlarged and detached, with a portion of the upper belt removed to disclose the mechanism. Fig. 3 is a front elevation of the machine with the parts in the same position as in Figs. 1, and 2. Fig. 3<sup>a</sup> is a sectional elevation taken approximately on the line *x, x*, Fig. 2<sup>a</sup>, showing also the deflector and the knife standard or guide. Fig. 4 is an enlarged front elevation of the upper portion of the machine detached, showing the oscillatory transferrer, the rolling table, and the forming



knife standard, certain parts being broken away to preserve clearness in illustrating, the parts being in substantially the same position as in Figs. 1, 2, and 3. Fig. 5 is a sectional elevation taken approximately on the line  $y, y$ , Fig. 4. Fig. 5<sup>a</sup> is a front elevation of a portion of the rear end of the rolling apron, of reduced size, and the means for securing it to its controlling mechanism. Fig. 6 is a sectional elevation of a portion of Fig. 5, diagrammatically illustrating the operation of feeding the charge to the pocket in the oscillating transferrer, and showing how it is held by the pocket and the forward portion of the throat while being conformed by the forming knife. Fig. 6<sup>a</sup> is a longitudinal sectional elevation through the center of the oscillatory transferrer cylinder, showing the means for increasing or diminishing the depth of the pocket, the ends of the cylinder being broken away. Fig. 7 is an enlarged front elevation in perspective of a portion of the table or bed showing the forming knife, the gore ejectors and grippers, the ejector hub abutment, and certain operating mechanism. Fig. 7<sup>a</sup> is a bottom plan of the forming knife and its shank. Fig. 8 is a plan view of Fig. 7. Fig. 9 is a plan view of the front of the throat top and bottom, the gore ejectors and grippers in position, and the hub abutment. Fig. 9<sup>a</sup> is an enlarged sectional elevation on the line  $x^a, x^a$ , Fig. 7, showing one of the gore ejectors and grippers and its connections. Fig. 10 is an enlarged and detached side elevation of the pouch forming and conveying mechanism for the rolling table, and the means for operating the same. Fig. 11 is a plan view of Fig. 10. Fig. 12 is a side elevation through the rear of the rolling table and its supports, showing the slack distributing device in a position ready to distribute the slack. Fig. 13 is a like view showing the distributor in position for distributing the slack.

Similar numerals of reference refer to like parts throughout the several views.

I shall first describe the main frame of the machine and the main driving elements.

At 1, 1<sup>a</sup> are side frames or standards which are tied together by suitable tie bolts as indicated at 2, Fig. 1, the bolts being omitted from the front and top views in order to prevent confusion, and at the top by a bed plate 3 which is secured to the top of the side frame by suitable nuts or screws such as 4. A second frame for supporting the feeding trough and ironing device extends out from the side of the main frame, and comprises a leg 6, and angle-iron top-piece 7 having a bed plate 8 which extends into the main frame to form the support of one end of the rolling table as shown in Fig. 13, the top piece being otherwise supported in the side frame 1<sup>a</sup>.

In suitable bearings 9 (see Fig. 1) on both side frames is mounted a transverse drive shaft 10, having on one side a fast pulley 11 and loose pulley 12 for co-operation with

a suitable belt shifting device leading from a source of power. Upon the shaft 10 is fixed in any suitable manner a pinion 13 which gears with the speed gear wheel 14 on the shaft 15 which is mounted in bearings in the cross bar 16, Fig. 1 of the side frames 1, 1<sup>a</sup>.

I shall now describe the mechanism for feeding the stripped leaf and the ironing mechanism, in which the whole leaf is first stripped, as usual, and its full length utilized.

Referring to Figs. 1 and 3 it will be seen that on the shaft 15 is mounted a disk-cam 17, and adjacent thereto a tappet 18, the tappet being shown in side elevation in Fig. 1, where also the cam groove 19 of the disk-cam 17 can be seen. Upon the shaft 10 is secured a rocker arm 20, its lower leg engaging with the surface of the tappet, Fig. 1, the tappet moving it rearwardly, and as the tappet moves away from the rocker the lower leg is moved inward by the weight of the upper arm of the rocker and its appendages. The rear portions of the side frames 1, 1<sup>a</sup> near their upper portions are tied together by a cross bar 21, the end of which is shown in dotted lines in Fig. 1, the cross bar having ears through which pass the bolts 22, and dependent from this cross bar is a journal bearing 23 also shown in dotted lines, from which extends a short shaft or spindle 24. Upon this spindle is secured a gear wheel 25 which is used in this case as a ratchet wheel, and movably secured upon the shaft 24 is a pawl lever 26 carrying a pawl 27 pivoted thereto, and which engages the teeth of the ratchet wheel through its weight. Extending between a boss 26<sup>a</sup> on the lever 26 and the upper leg of the rocker 20 is a connecting rod 28, the lower part of the connecting rod being secured to a movable crank arm 29 fast upon the short stud 30 which is adapted to move in a slot 31 formed in the outer portion of the upper leg of the rocker 20. This slot is formed therein for the purpose of increasing or diminishing the throw of the lever 26, so as to vary the movement of the pawl on the ratchet wheel, and cause it to engage more or less teeth, and this for the purpose of increasing or diminishing the amount of movement given ultimately to the feeding belts, so that by adjusting the stud 30 within the slot 31 the train of tobacco will be given a movement at each rotation of the power wheel corresponding with the length of the cigar which it is desired to produce; that is to say, should it be desired to make a five-inch cigar a charge of filler of the desired length will be cut from the train of leaf, through the instrumentality of the adjustment just before described, and should it be desired to change the length of the cigar, say, for instance, to four and one-half inches, it is only necessary to move the stud inward toward the shaft 10 and secure it at the desired point. This will shorten the throw of the pawl lever 26 and cause the pawl to traverse fewer teeth of the ratchet wheel both in going forward and



coming back, and through the instrumentality of the hereinafter described mechanism give the train of tobacco leaf a forward motion just sufficient to move four and one-half inches of the train past the knife which severs the charge from the train. The sides of the slot can be marked in any suitable way to indicate the amount of adjustment necessary to obtain the desired feed. Although I prefer this form of mechanism I do not limit myself to such, as the variation in feed can be otherwise accomplished.

Secured to one of the side frames in any desirable way and extending upwardly therefrom are two journal blocks 32, 33 which form bearings for a short longitudinal shaft 34, the shaft 34 carrying outside of the journal block 32 the pinion 35, which gears with the companion pinion 36 located directly below it and fixed to a short shaft 37 journaled in the journal block below the shaft 24, Fig. 3<sup>a</sup>, and upon this shaft is a reducing pinion 38 which gears with the ratchet wheel 25. The gearing just before described is of the usual form used in reducing or increasing speed.

Secured upon the shaft 34 by means of its hub 39 is a grooved pulley 40.

From the web or bed plate 8 on the extension 7 are the outwardly and upwardly extending journal blocks 41, 42, 41 being shown in Fig. 1 and 42 in Fig. 3. Extending between the journal blocks 41, 42 is a transversely extending angle iron 43 which is secured to the said journal blocks by bolts 44, and extending between the side frame 1<sup>a</sup> and the angle iron 43 is a flat plate 45 (see Fig. 2) from the sides of which extend upwardly two guide plates 46. On an extension 47 of the bed plate 45 is journaled a small grooved pulley 48, and in the cross bar 43 are journaled two upright spindles 49, 50, their upper ends being steadied by a bar 51 which is secured by the bolts 52<sup>a</sup> to the top of the journal blocks 41, 42, and upon the upper portion of the spindles 49, 50 are two companion gears 52, 53. Upon the spindle 50 is fast a grooved pulley 54, Fig. 1. A drive chain 55 is rove around the pulleys 40, 54, and plays against the guide pulley 48.

The feeding trough is constructed as follows: The feeding belt or belts 56, 57 are of leather, their inner ends working in pulley blocks 58, 59, their rear ends working in the grooved pulley blocks 60, 61 which are mounted to revolve upon the spindles 62, the spindles being secured in any desirable way to a bracket 64 mounted upon arms 65 which arms are secured to uprights 66 on the bed plate or web 8. The spindles 62, are inclined at an angle so as to form a bight at the rear end of the trough which gradually expands as the belts 56, 57 approach the pulley blocks 58, 59. The object of this bight is to prevent a backward movement of the leaf, and to cause the side belts to get a good hold of the leaf at this point. Mounted upon a shaft 67 journaled in the uprights 66 is a transverse

pulley block 68 about which passes a belt 69, which extends forward and passes over a counterpart pulley block 70 fixed to the shaft 37 upon which the reducing gear wheel 38 is fast. The belt 69 is in reality a conveying belt, and forms the lower feeding element of the entire feeding mechanism, and the side belts 56, 57 are used for the purpose of preventing the stream of leaf from being retarded by too much friction which would oppose the travel of the stream of leaf were the walls of the trough stationary and not movable. From the bed plate 71, or, in other words, the stationary bottom of the trough, extend two walls 72, 73 which form abutments for the side belts 56, 57, and which keep the side belts confined, so as to form a trough of a certain definite size against which the belts impinge during the movement of the stream of tobacco. This bed plate 71 can be continuous with the plate 45 as shown in Fig. 3<sup>a</sup>.

The foregoing sets forth mechanism whereby the stripped leaf is fed inward or transversely to the line of travel of the cut charge, and is securely held during the feeding operation so as not to permit of a disengagement of the leaves from each other, the feeding being accomplished in an intermittent manner by mechanism under the control of the operator, who can vary the length of travel of the leaf train at will to vary the length of the cut charge.

My feeding mechanism also embodies means for pressing out or ironing the leaves so as to cause them to lay straight and flat. This is what I call the second element of the feeding mechanism, as this operation follows the initial movement of the leaf given it by the trough which is the first or primary element. The first element merely compresses the leaf sufficiently for the purpose of moving the train, leaving it free above. The second element is contracted vertically, in which contracted section the ironing device is located, and between the first and second elements, and at the mouth of the second is a deflector which enables the train to enter the contracted section without humping or turning the leaves upwardly upon themselves.

I will now describe the ironing mechanism and associated parts. Upon the shaft 34 which finds bearing in the journal blocks 32, 33 is fixed a drawing pulley 74, and in the journal blocks 42, 43 is journaled a short shaft 75 upon which an idler pulley block 76 is secured, and between the pulley blocks 74, 76 extends the ironing belt 77 so called. The device for causing the ironing belt to press upon the stream of tobacco moving it forward after it has emerged from the trough in the manner hereinafter to be described comprises a series of interlocking pressure rollers mounted in a suitable frame and a superposed friction roller which operates through the instrumentality of a spring to force or press the interlocking ironing rollers down upon the ironing belt, while the friction roller ex-



tending upwardly above the frame takes out the slack in the ironing belt and causes the same to press evenly upon the stream of advancing leaf, while the ironing rollers flatten and press out the leaves lying below them and the ironing belt and between it and the feeding belt 69. This ironing mechanism comprises the two plates 78, 79 united by the cross bolts 84 into a frame which rests on the guide plates 46, in which frame and guide plates there are a number of short shafts or spindles 80 mounted in segmental bearings, that is to say, the opening at the bottom of the frame plates in which the spindles move permitting the frame and spindles to be lifted by the leaf without unseating the spindles. These spindles carry a series of interlocking rollers 81, each roller comprising a hub and concentric and angular projection, the projection interlocking or lying between the space caused by each opposing annulus. Above any one or the rollers is located a friction roller 82 mounted on a spindle 83 which lies in an open bearing in the side frames or plates 78, 79 as shown in Figs. 3 and 2<sup>a</sup>, and each end of the spindle has connected thereto a spiral spring 83<sup>a</sup>, the other end being secured to the bed plate 71.

Momentum being given to the pawl and ratchet mechanism of the feeding device, and as before described to the two upper and lower drive pulleys 70, 74, through the medium of the intervening reducing gearing, will operate the upper and lower belts 69, 77, and through the drive belt 55 and connections move the trough belts. The stripped leaves being placed in the feeding trough, preferably overlapping each other, they are moved forward by the conveying belt 69 and side belts 56, 67 to the ironing mechanism, the entrance thereto being guarded by a chute or deflector like device as seen in Fig. 3<sup>a</sup>, and which is a wedge shaped body 85, its mouth lying between the two pulleys 58, 59, and it being secured in place by means of a tongue 86 fastened to the cross bar 51, a plate spring 87 being fastened to the tongue and lying over the entrance to the deflector, so that as the stream or train of leaf advances to the ironing mechanism it is forced downward into the narrowed space lying between the ironing and conveying belts 69, 77, the spring tongue preventing the upturned ends of any particular leaves from rising or becoming bent over themselves, and the sides of the deflector lying closely adjacent to the surfaces of the belts 56, 57 enables the leaf to pass smoothly into the deflector while under pressure. As the stream of leaf progresses forward under the ironing belt 77 the spiral springs 83<sup>a</sup> press the friction roller 82 down upon the interlocking roller directly below it and at the same time the spindle 83 of the friction roller forces down the frame comprising the side plates 78, 79, which in turn presses upon the spindle ends of the interlocking rollers forcing them all down upon

the leaf and pressing and straightening out each separate leaf of the stream. Should the stream of leaf be too thick as it comes under the rollers it will lift them and the frame against the roller 82 and its springs or the upper belt 77 and press the leaf with just sufficient force to iron it and without breaking the leaf. The roller 82 lying above the longitudinal plane of the rollers 74, 76 raises the belt 77, makes it taut and takes out all the slack so that the pressure of the belt upon the leaf at points not affected by the interlocking rollers will be uniform throughout. Thus far the train of leaf has been advanced but to the point where it meets the severing knife, which forms the means for producing a charge of tobacco or a filler of a certain definite length which has been previously determined upon.

I shall now describe the device for severing the train of leaf to form the charge and the means for automatically feeding the charge to the forming knife or cutter, the device for so feeding it forward embracing means for giving to the charge a varying amount of pressure according to the looseness or density of the bunch desired, which pressure acts to move more or less of the severed charge to form a thicker or thinner bunch, which pressure can be adjusted for this purpose.

Extending upwardly from the bed plate 3, Fig. 2 is a slide rest 88 secured to the bed plate by the bolts 89, and within this slide rest is dovetailed a slide 90 carrying on the end thereof a knife blade 91, Fig. 3<sup>a</sup>. Secured to the outer face of the slide 90 is a pin 92 to which is secured one end of a rocker 93 having a slot 94 in which the pin 92 works, the other end of the rocker being fast to the transverse shaft 95 set in upright bearings 96. (See Figs. 1, 2, 5, and 6.) On the outer end of the shaft 95 is a short crank 97, Fig. 2 to which is secured a connecting rod 98 leading down to the base of the main frame and having a pin or roller 99, Fig. 3 near its lower end, which engages with a cam groove formed on the inner side of a disk-cam 100 fast to a shaft 101, the end of the rod being slotted and playing on the shaft 101 or the hub of the disk-cam 100 for guidance. The shaft 101 receives rotation through the fast and loose pulleys 11, 12 on the shaft 10, through the pinion 13, the large gear 14 fast upon the shaft 15, through the reducing gear wheel 102 fast on the same shaft, to a companion wheel 103 fast on the shaft 101, through which a continuous rotation is given to the disk-cam 100, the roller 99 operating in the cam groove vibrating the connecting rod 98 up and down and oscillating crank 97 and shaft 95 vibrating the rocker arm 93 which in turn moves the knife slide 90 and cutting blade 91 up and down in the slide rest severing a sufficient charge or length from the train of leaf which has been advanced through the slide rest which is apertured to receive it as shown in Fig. 3<sup>a</sup>.



The feeding and ironing belts 69, 77 are connected with the cutting knife by means of a flexible channel constructed as follows: The stream of tobacco is not severed, however, until the forward portion or end of the same has been moved by the intermittent mechanism before described across the charge receiving throat which will now be described. The throat comprises two walls 89<sup>a</sup>, 89<sup>b</sup> and 90<sup>a</sup> on each side, the slide rest 88 and the knife blade 91 itself forming a continuation of the wall 89<sup>a</sup> and bridging the space between the two blocks 89<sup>a</sup>, 89<sup>b</sup>, and upon both walls is placed a glass plate 112, the glass plate being secured down upon the walls by means of clamps 113 which are adapted to move in slots 114 formed in the bed plate 3, and be secured at any point thereon by means of the screws or bolts 115, the plate 112 confining the cut charge, and being transparent permitting the same to be seen at all periods of its movements.

The slide rest 88 and rocker 93 being adjustable as before described the throat can be widened or narrowed at pleasure so as to accommodate varying lengths of charges, the width of the throat as in Fig. 2 being practically as wide as would ordinarily be used, and if widened still farther, another glass plate can be substituted. It will not under ordinary circumstances be necessary to do this, as I propose to make the throat as wide as the longest cigar required by the trade, and provide a scope of adjustment to all the co-operating parts commensurate with the adjustment made in the throat.

A plunger 116 secured upon a rod 117, supported and operated as hereinafter set forth, works within the throat and preferably stretches across the entire width of the same, the plunger being moved by its operating mechanism forward and forcing the cut charge toward the forming knife. Should it be desired, as hereinbefore stated, to alter the length of the charge after the pawl and ratchet mechanism have been altered, the bolts 115 will be freed and the nuts confining the slide rest loosened which permit the slide rest and its ears on the one hand and the wall 111 on the other hand to be moved to or from the longitudinal axis of the rod 117 so as to shorten or widen the throat, the pawl and ratchet mechanism moving the train of leaf forward in accordance with the number of teeth of the pawl wheel operated or passed which causes an increase in the length of the stream or column of leaf passing through the slide rest to the opposing wall of the throat, the entire mechanism being so timed and adapted that the cutting knife will move downward only after the head of the stream has passed entirely across the throat and presented the desired length for severance. It must be here noted that the movement of the connecting rod 98 and its roller 99 in the cam groove of the disk-cam 100 is so timed and proportioned that the

knife 91 in its up and down movement will have a rest which would be sufficient for the passage thereunder of sufficient of the train of leaf to enable as long a charge to be cut as desired, so that it is not necessary to change the speed of the movement of the cutting device to get this change in length of the charge, but the accommodation of these parts is had through the amount of travel given to the feeding mechanism due to the increase in the number of teeth in the ratchet wheel operated upon by its pawl, the knife 91 remaining quiescent whether the minimum or maximum length is to be severed from the train of leaf. This change in the size or width of the throat necessitates an increase in the width of the plunger. In the present case this would be accomplished by removing the plunger, unshipping its connections and unscrewing it from the rod 117 and putting in a longer or shorter plunger as the case may require.

Referring now to the plunger and its associated mechanism upon an extension 118 of the bed plate 3 are secured posts 119 between which and posts 120 on the bed plate 3 extend the guide rods 121. A cross head 122 has a movable bearing on the guide rods 121. From the extension 118 extends a rectangular frame 123 having journal blocks 124, 125 thereon, and in the journal blocks 124, 125 is journaled a short shaft 126 upon which are grooved pulley blocks 127, 128, the last being larger than the former. To the pulley block 128 is secured at one end a rope or belt 129 to the other end of which is detachably secured a weight 130. To the pulley block 127 is secured at one end a flexible rope 131, the other end being secured to a stud 132 on the end of the plunger rod 117. The plunger rod is supported at its rear end by the bearing 125, and at its forward end by another bearing 133 on the bed plate extension 118. On the rod 117 is fixed a collar 134 directly behind the cross head 122, which collar moves with the rod 117, which movement is had through the weight 130, the two pulleys, and connecting ropes causing the collar to bear against the back of the cross head 122, during certain portions of its movement as will be hereinafter set forth. The weight and pulleys acting on the plunger through the connections before described brings a yielding pressure on the plunger against the severed charge, the weight being sufficient for the purpose of moving the charge through the throat under the forming knife and subsequently into the oscillatory cylinder which will be hereinafter described, and at the same time exerting a varying pressure in accordance with the amount of force exerted upon the plunger rod or plunger itself. This can be varied by varying the weight 130, and by adding to or subtracting therefrom in any desired way sufficient force will be exerted upon the charge in the throat to feed the desired amount of cut leaf past the forming knife or to give it



its desired density, so that if less leaf is required or a very loose bunch is desired the pressure on the plunger will be less than it would be were a more dense bunch required, the plunger acting to feed the desired weight of filler to the forming knife.

The cross head simply acts as a retractor for the plunger, and during its forward movement the collar 134 may become separated from the cross head due to the amount of pressure which the plunger is exerting upon the charge, so that in the forward movement of the cross head the collar 134 will follow the cross head until the plunger begins to exert pressure upon the charge, then the cross head will lead the collar in its forward movement. On its rearward movement the cross head strikes the collar and moves the plunger rod in its bearings rearwardly, retracting the plunger and bringing it to the end of its stroke or movement in the throat, after which follows another feed or movement of the leaf train under the knife 91, and a severance thereof, adding an additional charge to that already in the throat.

The means for reciprocating the cross head are as follows: Leading from the cross head 122 are two links 135 connected at their outer ends to two rocker arms 136 which are fast to a shaft 137 mounted in journal blocks 138 on the rear of the side frames. The arms 136 can be connected by cross bars as at 136<sup>a</sup>, Fig. 1. Near the bottom of the forward portion of the frame is journaled in bearings 139 a cross shaft 140 from which extends a crank arm 141, to which is secured a rearwardly extending connecting rod 142, the union of the connecting rod and crank arm being made close to the shaft in order to get the proper throw to the connecting rod 142. As seen in Fig. 1 the connecting rod 142 is secured to the lower cross bar 136<sup>a</sup> extending between the arms 136 near their point of support, and these arms on both sides being connected in the manner before set forth to the cross head, the throw or movement of the cross head will be greater than the movement of the crank arm 141 on account of the manner of connecting the same.

Leading from the disk-cam 17 is a link 143 at one end of which is a roller 144 which plays in the cam groove 19, the end carrying the roller having a slot 145 (see Fig. 1) which encircles the shaft 15 and supports the link 143 during its actuations by the cam groove. The forward end of the link is secured, as shown in Fig. 3 to the crank arm 141. The shaft 15 being connected to the power shaft 10 as before described, and the disk-cam 17 being secured to the same shaft, a rotary motion being given to the power wheels, the disk-cam will rotate, and by means of the roller 144 in the cam groove 19, will vibrate the link 143 and crank arm 141 on the shaft 140 which in turn imparts a like movement to the connecting rod 142, and like movement to the rocker arms 136, which through their

connections with the cross head, reciprocate it back and forth upon the guide rods 121. It is well however to state right here that by the word charge it is not meant that the severed portion of the train is the exact amount of leaf eventually placed in the bunch, for the width of the train preferably remains constant. If it were not so the feeding trough and ironing device, as well as the slide rest 88, would have to be made adjustable transversely. This would be objectionable, so I have adapted my machine to feeding into the throat a train of leaf of a constant width, and cause the change in the amount of leaf placed in the bunch to be accomplished by varying the pushing force of the plunger.

The successive severed charges moved in the throat simply form an accumulation of severed leaves from which is taken (that is from the forward portion of the series of charges it forms in the throat) just sufficient to form a bunch or filler of the desired length, through the action of the plunger, each successively presented severed charge taking the place of the last. In practice the first charge is cut by the forming knife as the series of charges in the throat do not at that time extend to the knife, but a few repetitions of the feed and charge cutting will place sufficient leaf in the throat to form a series of charges between the plunger (forward movement) and the oscillatory transferrer cylinder from which the forming knife cuts the conformed filler. Thus the successive severed charges are advanced to the forming knife, which will now be described.

Extending upwardly from in front of the forward edge of the bed plate 3 is a dovetailed slide rest 145 having an outwardly extending web 146, Fig. 7 and ears 147, through which pass the bolts 148 on each side of the slide rest, the bolts securing the ears and the slide rest to the bed plate 3. From a little below the top of the slide rest extends on both sides a dovetailed projection 149, which serves as a guide for the dovetailed knife shank 150 from which extends a stud 151, the lower portion of the shank having a flanged extension 152. This flanged extension carries two oppositely disposed blades 153, 154 shaped to a longitudinal section of the exterior contour of the cigar, and which are held in place at their ends by thimbles 155 and rivets 157 and centrally by a rivet 157<sup>a</sup>, the thimbles being tapped at the top and receiving screws 158 which pass through the flange 152 and keep the knife shank and blades together, which also forms means for readily attaching the knife, for a purpose hereinafter set forth. It will be noticed by reference to Fig. 7<sup>a</sup> that a V shaped space is left between the blades at a point commencing at a distance from each side of the center or union of both of them outwardly toward their ends. This space indicates the dummy stock that is removed in order to give the resultant shape to the filler.

Referring now to Fig. 9 it will be seen that



there is formed at the extreme outer end of the throat 156 in which the plunger 116 moves, a shearing block, comprising on the one hand the bar 157<sup>b</sup> secured over the end of the throat 5 156 so as to leave a space between the floor of the throat and the bar 157<sup>b</sup>, the outer edge of both the throat and the bar being conformed to the shape of the blade 154, and on the other hand by an abutment block 158<sup>a</sup>, 10 (which has a front surface conformed to the shape of the transferrer cylinder hereinafter to be described, and against which the surface of the said cylinder closely opposes) the inner edge of the abutment block conforming 15 to the shape of the blade 154, both the throat, the cross bar 157<sup>a</sup> and the abutment block 158<sup>a</sup> forming a shearing block which holds the stock against the shearing action of the knife, and also forms a guide for the knife 20 blades, keeping them in position. The abutment block is rigidly secured to a cross bar 159, which in turn is supported by the side frames 1, 1<sup>a</sup> of the machine as seen in Fig. 5.

The train of severed charges of tobacco as 25 it is moved forward in the throat by the plunger passes under the cross or shearing bar 157<sup>a</sup> and into the pocket of the transferrer cylinder hereinafter to be described, there then being a body of tobacco leaf extending 30 from a pocket in the transferrer cylinder through and across the shearing block and under the cross bar 157<sup>a</sup>, and back into the throat to a distance determined by the amount of pressure given to the series of charges, and 35 the amount of leaf fed. With the charge in this position the action of the knife in advancing will be to simultaneously cut or conform the charge on the line indicated by the inner end of the abutment block, to wit: the 40 shape of the transferrer cylinder, and also to sever from that portion of the charge directly within the throat and under the cross bar 157<sup>a</sup> (which will form the front of a subsequent charge) a portion thereof which will 45 conform to one side or the forward side of either the pocket in the transferrer cylinder or the cigar itself, which during the next succeeding motion of the plunger is shoved forwards into the transferrer cylinder, and thus 50 the operation of severance is continued on. On the initial operation of the machine it may happen that both sides of the charge are not properly conformed and this improperly formed charge can be discarded, but the successive presentation of severed charges to the 55 forming knife adapts them in shape to the bunch to be produced, as in the manner just before described, and this without any compression of the filler to get the desired shape, the knife severing the tobacco on the two opposing reverse sides, which results in the proper shape. This operation leaves the dummy blanks or waste stock between the 60 ends of the two opposing blades, as before suggested, and the device for ejecting these dummy blanks after the forming knife has operated will now be described.

Upon the shaft 101 is fixedly secured a disk-cam 160, and upon the sleeve of this cam or the shaft itself is a slotted connecting rod 161, 70 the slot in the end of the rod surrounding the shaft or sleeve and guiding said rod in its movements up or down. The upper end of the rod 161 is connected to a rocker arm 162 fulcrumed on the side frame 1<sup>a</sup> at 163, Fig. 2, 75 the rear end of which is connected to an upwardly extending arm 164 by the pin or bolt 165, which in turn is pivotally connected with a cross bar 166 fulcrumed in a support 215 on the side frame 1 at 167. The rotation of the 80 shaft 101 causes the roller on the arm or rod 161 to play in the cam way of the disk-cam 160, which lifts said rod, vibrating the rocker arm 162, lifting the rod 164, and cross bar 166. The cross bar 166 is connected with a slide 85 bar 168 moving in a slide way in the rear of the slide rest 145, by means of the pin 169. (See Fig. 1.) The web 146 of the slide rest carries journal blocks 170, through which extend the short shafts or spindles 171. (See 90 Fig. 7.) The rearward ends of these short spindles carry small crank arms 172, which are connected to the slide bar 168 by means of the links or arms 173 and pins 173<sup>a</sup>.

The forward ends of the spindles 171 carry 95 the expansive gripping and ejector jaws, which operate in the double capacity of forming a continuation of the throat in which the severed charge lies while being conformed by the forming knife, and also as means of eject- 100 ing the dummy charge or blank after severance by the forming knife. These jaws comprise the ejecting finger 174 fast upon or cast with the spindles 171, the forward end 175 of which is conformed to the shape of the con- 105 tiguous portions of the throat 156 and the rear of the abutment block 158<sup>a</sup>, so as to form in a measure a guide for the blades in their upward and downward movement and a support for the stock, and also to snugly lie 110 therein for the purpose of carrying between it and the movable portion of the jaw, hereinafter to be described, the dummy stock in the same manner as it would be grasped by two fingers, until such a time as the lower 115 portion of the jaw is independently moved to permit the dummy blank to drop out of the grasp of the jaw. As both jaws are alike I will describe but one. The ejector finger 174 of the jaw has upon its rear end a downwardly 120 extending projection 176, upon which is formed a lug 177, which is also provided with a set screw 178. The lower and independently movable portion of the ejector is formed in part by the arm 180 which is movably mounted 125 upon the spindle 171 and secured by the spindle screw 180<sup>a</sup> and by a finger 178<sup>a</sup>, the forward end of the finger being V shaped as at 179. The upper surface of the finger 178<sup>a</sup> is flat as shown, and when in the position shown 130 in Fig. 7, (that is when the oscillating transferrer cylinder and its pocket have arrived in front of the throat) will lie flush with the forward end of the throat and fill up the space



between it and the abutment block 158<sup>a</sup>, so as to form a continuation of the throat and a supporting medium for the stock. Between the end 180 of the finger 178<sup>a</sup>, and the ejector finger 174, lies a coil spring 181 by means of which the lower finger 178<sup>a</sup> is kept parallel with the upper finger so as to form a continuation of the throat for holding the charge as above stated. The set screw 178 is used for the purpose of limiting the upward movement of the upper jaw so as to determine its position within the knife.

Upon the web of the slide rest 145 and by means of the bolts 148 are secured outwardly extending stops 182, which are adapted to engage the lug 183 on the arm 176. During the downward movement of the front portions of both sections of the jaw the spring 181 keeps both the jaws parallel, the lug 183 strikes the stop 182, and by a continuation of the rotation of the short spindles 171 causes the lower half of the jaw to continue its vibration, compressing the spring 181, which at the same time distends the jaws, permitting the dummy charge to fall out. The coil spring is used for the purpose of causing both portions of the jaw on their return motion to become parallel keeping them distended and at the same time when the lug 183 is in contact with the stop 182.

I will first describe the means for operating the forming knife, and then the combined operation of the knife and the ejector jaws.

From the side frames extend journal blocks 184, and from the journal block 184 on the frame 1<sup>a</sup> rises the standard 185, Fig. 4, to which is pivotally secured by the pin or bolt 186 the cross arm 187, which is pivotally secured to the pin 151 on the knife shank 150, the other end of the cross arm 187 being secured to an upwardly extending link 188, Fig. 1, which is in turn secured to a rocker arm 189, journaled on the pin 190 secured to the side frame 1. This rocker arm is connected by a connecting rod 191, the lower portion of which has a slotted extension 192, through which the shaft 101 passes, and which guides the movement of the rod 191 up and down. On the shaft 101 is secured a disk-cam 193 in the groove, Fig. 1 of which moves the pin 194 secured to the rod 191. This disk-cam takes its movement as before described by the rotation of the shaft 101, during which the connecting rod 191 is lifted, the rocker arm 189 vibrates, and the cross arm 187 in turn vibrates upon its fulcrum through the connecting link 188. The knife shank 150, being connected to the cross arm 187, in the manner before set forth, the forming knife is reciprocated up and down, the dovetailed guide 149 forming a bearing for the knife shank during these movements.

It has been before described how the charge is pressed forward under the knives and into the pocket of the transferrer cylinder, and assuming them to be in a position shown in Fig. 7, which is at the end of their upward

movement (at which time the pocket in the transferrer cylinder will be disposed at a right angle thereto, or over the rolling apron, as in Figs. 4 and 5, and the ejector jaws also in position shown in that figure,) the forming knife is then moved downward shaping the rear edge of the charge which is in the pocket of the transferrer cylinder, and the forward end of the succeeding charge which lies in the throat and between the upper and lower sections of the transferrer jaws. The movements of the parts are so proportioned and timed that when the blades are in their uppermost position, the ejector jaws are parallel and form a continuation of the throat, and when the blades are at the end of their downward stroke then the ejector jaws carry the dummy blank to below the level of the throat and out from the blades and separate and discharge the same. After the charge has been formed as before set forth the transferrer cylinder with the formed charge in its pocket is turned so as to present the pocket downward and over the rolling apron as shown in Fig. 5.

The transferrer cylinder 195, Fig. 6<sup>a</sup> is formed integral with trunnions 196, which have at their outer ends spindle bearings 197 set in the journal blocks 184, (see Fig. 4) the central portion of the cylinder being enlarged as at 197<sup>a</sup> in which a pocket 198 is formed, the exterior of the enlargement 197<sup>a</sup> being conformed preferably to the shape of the cigar and which also conforms to the shape of the abutment block 158<sup>a</sup> and to the forward blade 153, of which the rear blade 154 is the reverse. At the top of the pocket 198 is secured a cross bar or guide plate 199, which forms both a support and a guide for the rods 200 and 201, connected at the top by a cross bar 202 and suitable nuts 203. Within the pocket 198 and secured to the lower ends of the guide rods is a plunger 204 which preferably should accurately fit the pocket. By reference to Fig. 6<sup>a</sup> it will be seen that the lower end of the plunger conforms to one side of the cigar and is the reverse of the lower end of the pocket which represents the contour of the extension or hub of the cylinder. Set screws 205 extend through tapped holes in the guide bar 199, and between the guide bar and the nuts on the outer guide rods 201 extend spiral springs 206, which may bear against the cross bar 202 at any other point instead of against the nuts 203. These springs lift the plunger on its return stroke, and the set screws 205, in accordance to the amount of their extension from the guide bar 199, regulate the amount of the return movement of the plunger so as to regulate the depth of the pocket 198, which will result as before stated in a larger or smaller or looser or a denser bunch in accordance with the desire previously determined upon, it being understood that the throat plunger and its moving weight exert a constant pressure upon the charge. There are two separate and distinct



manipulations which can be had in the machine in this regard which it would be well to state here.

As already stated the pocket can be enlarged and with its enlargement and an equal amount of pressure upon the throat plunger a greater amount of stock can be forced or fed into the pocket in the transferrer cylinder, and thereby the size of the bunch can be increased, and if it is desired to reduce the size of the bunch the pocket can be reduced in size by the set screws which will reduce the amount of stock forced into the pocket and thereby the diameter of the bunch. The other manipulation is in increasing the density of the filler, and consequently the bunch as may be desired by adding weight to the device which moves the throat plunger and retaining the same size of pocket in the transferrer cylinder, which will cause an added amount of force or pressure to be exerted upon the charge moving into the pocket, thereby condensing it.

The means for oscillating the transferrer cylinder, and operating the plunger is as follows: Upon the shaft 15 is secured a wing cam 207, the shaft receiving rotary motion as before described, and upon the spindle extension 197 of the transferrer cylinder is secured a short crank arm 208, which is connected to a rod or bar 209 which has a slotted extension 210, the slot of which works upon the shaft 15 as shown in Fig. 1 for guidance. The extension 210 of the bar 209 carries a pin and roller 211, which is adapted to be brought into contact with the wing cam 207 by means of the spiral spring 212 fast at one end to a pin 213 on the rod 209 and at the other end to a loose sleeve 214 on the shaft 15. Thus it will be seen that if the shaft is rotated the wing cam will be carried around, and when its point of greatest projection strikes the roller 211 of the rod 209, it will lift that rod, vibrate the crank arm 208, and with it the transferrer cylinder 195, the parts being so timed that during the upward movement of the forming knives the ejector cylinder will be oscillated downwardly and forwardly until its pocket is directly over the rolling apron as shown in Fig. 5, a sufficient rest being given to the movement of the knives to permit of these two operations, to wit: the operation of oscillating the cylinder and the movement of the ejecting plunger. The ejection is accomplished as follows: Secured to the right hand journal bearing 184 is a standard 215, to which is pivotally secured by a bolt 216 a rocking goose neck 217, having on its outer end a roller 218 rotatably mounted on the pin 219. Between the end of the gooseneck and its fulcrum 216 is pivotally secured a rod 220, which extends upwardly and has a slotted extension 221 which plays upon the shaft 101, the lower end of the extension carrying a pin 222 which works in a cam groove in the disk 223 fast upon the shaft 101 as shown in Fig. 3. The

cam in this disk has a very small pitch by reason of the fact that the movement of the goose neck is augmented through the variation of the distance between its ends and its fulcrum and the point of securing the rod 220 thereto. When the cylinder has reached the point shown in Fig. 5 with its pocket downwardly, the gooseneck and its operating elements are so timed as to cause the roller to bear downwardly upon the cross bar 202, which moves the plunger 204 against the stress of the springs 206, forcing the charge down upon the apron (now a shaped filler) and into a pouch formed in a reciprocating carrier jaw, from whence it is brought to the level of the rolling table released, a binder laid upon the table and the apron, upon which the filler is moved, thence along the rolling table to a movable carriage which conveys the rolled filler or bunch to a suitable distance away from the rolling table, where it is taken from the carriage by a second operator who places the rolled filler or bunch into a conforming mold.

The rolling table comprises a block of wood or other desirable material 224 having an upper portion formed to a suitable curve at the front end of which is secured the rolling apron 225, the rear end being secured to a stirrup 226 (see Fig. 5<sup>a</sup>), which is pivotally secured to a rocking lever 228 mounted on a pin 229 on a lug 230 depending from the bed 231 of the rolling table, the forward end of the lever 228 carrying a cross bar 228<sup>a</sup>, the forward end of the bed 231 being secured to a plate 232, which is in turn secured to a carrier way 233, which in turn is supported upon brackets 234 secured to the side frames 1, 1<sup>a</sup> (see Figs. 4 and 5), the forward end of the apron being held between the plate 232 and rolling table 224. The rear end of the bed plate 231 is supported by outwardly extending arms 235 upon the rear portion of which is secured a transverse bar 236 which extends between the arms 235, the bar 236 in turn resting upon a supplemental block 237 bolted to the bar 236, the block 237 in turn resting upon a T iron extension 8. (See Figs. 3 and 13.) This secures the rolling table in position and supports its co-operating devices. Extending upwardly from the arms 235 are pillars 238 between which extends a loosely mounted roller 239, over which the rolling apron passes and against which it bears during certain manipulations of the same. Upon the shaft 140 (see Fig. 3) is mounted a rocker arm 141 from which leads a link 143 to the disk-cam 17, and by means of which the link 143 is vibrated as before described. Secured upon the shaft 140 are two connecting arms 240 tied together by the bars 240<sup>a</sup>, 243 which vibrate forwardly and rearwardly synchronously with the arms 136 which withdraw the throat plunger, the upper ends of the arms 240 carrying the bunching roller 241 as in Figs. 3, 12, and 13. Below the lever 228 to the arms 240 is secured the cross bar 243 upon which the roller 244 is se-



cured, the lever 228 resting upon the roller 244, and being caused to engage therewith at all periods of its movements by the spring 245 secured to the bed 231 and to the ends of the cross bar 228<sup>a</sup> as shown in Figs. 4 and 5.

By reference to Fig. 5 it will be seen that the apron 225 passes around the bunching roller 241 and bears against the roller 239.

My invention includes a device whereby the charge, as it is ejected from the transferrer cylinder, is grasped and held firmly by a gripping conveyer or carrier, which is automatically raised to the transferrer cylinder, receives the charge therefrom, and conveys it downward to below the level of the rolling table from which the charge is drawn by the action of the bunching roller. It is very desirable, in this regard, to have means for automatically distributing the slack in the apron so as to permit of a pouch being formed in the apron within the gripper while the charge is being forced from the transferrer cylinder down upon the rolling apron and into the gripping carrier, and this slack distributing operation is performed after the bunching roller has passed under the transferrer cylinder and before the gripping conveyer begins to rise.

The mechanism and the operation thereof are as follows: The arms 240 carrying the bunching roller 241 at the top are operated, as before stated, through the instrumentality of the disk-cam 17, connection being made therefrom to the shaft 140 to which the arms 240 are secured, the disk-cam oscillating the arms 240. The lever 228 has a downward bend at its rear end as shown in Figs. 12 and 13 and in Fig. 5, which is caused to bear on the roller 244 on the rod 243 through the medium of the spring 245, so that the forward movement of the arms 240 lifts the rearward end of the lever 228 against the stress of the spring 245, and the rearward motion of the arms 240 draws the roller 244 away from the lever 228, and permits the spring 245 to move the rearward end of said lever downwardly, and the apron being connected with the rearward end of the lever 228 as before described is tightened or loosened in accordance with the direction of the movement of the lever 228. The arms 235 are provided with downwardly extending brackets 246 to which is pivotally secured a frame composed as follows: The arms 247, the cross bar 248 at their ends, and upwardly extending arms 249 at the forward ends of the arms 247, and cross bar 250. The cross bar 248 extends between the arms 247 on both arms 235 and the cross bar 250 extends between the upright arms 249 on both sides, the arms and cross bars forming an L shaped frame which is pivotally secured to the projections 246 by means of screws or the like 251, the arms 249 being fast upon the arms 247 and movable with them. Secured about midway on the cross bar 248 and depending therefrom is a hanger 252 upon which is pivotally secured a dog 253 having a hook extension 254, the surface of which is rounded. The end

of the lever 228 is pointed at 255 as shown in Figs. 12 and 13 and is adapted to engage with the hook 254 on the dog 253. A spring 256 is secured to the cross bar 248 and bears against the hook 254 of the dog 253, tending to press it forward. The rolling apron 225 bears against the cross bar 250, and a spiral spring 257 is secured at one end to a plate 258 on the cross bar 236 of the rolling table bed and at the other end to the arm 249. Depending from the cross bar 236 at a point adjacent to the dog 253 is a small bracket 259 carrying thereon a stop or pin 260, the rounded end of the hook 254 being adapted to engage said pin, and from the arm 247 extends a pin 261 adapted to limit the forward motion of the dog 253. As the arms 240 are moved forward to cause an apron 225 and roller 241 to roll the binder about the charge and complete the bunch, the apron carries with it a certain amount of slack due to the presence of the charge within the apron, this slack being in the nature of a bight which holds the charge during the operation of rolling the binder about it. When the arms 240 recede, carrying back the bunching roller 241, this slack or bight is left at the forward end of the rolling table. The bunching roller in Fig. 12 is shown as on its rearward movement, at which time there will be slack in the apron at both sides, one forwardly and one rearwardly of the bunching roller. When the bunching roller has moved as far back as it will go, then the slack distributing mechanism begins to act; and this commences with the commencement of the forward motion of the roller 241. As the arms 240 move forwardly, carrying the roller 241 with them, the roller 244 bears against the bottom of the lever 228 lifting its pointed end or tooth 255 upwardly until it strikes the hook 254 of the dog 253 which vibrates the frame before described on its fulcrum 251, throwing the cross bar 250 forcibly against the apron 225 (as shown in Fig. 13), moving the slack at the forward end of the rolling table and drawing it under the roller 241 to be utilized for the purpose of forming the pouch of the gripping conveyer as hereinafter described. The length of the arms 249 to which the cross bar 250 is attached being greater from the fulcrum 251 than is the point of attachment of the dog 253 to the cross bar 248, the movement of the cross bar 250 will be accelerated and perform its operation of distributing the slack in much quicker time than the bunching roller 241 moves, that is to say, that the cross bar 250 moves much quicker than the bunching roller 241. The forward movement of the frame causes the curved surface of the hook 254 to strike against the stop 260, and withdraws it from contact with the point 255 of the lever 228, releasing the frame and enabling the spring 257 to draw it back. Now the rolling apron is in position to be moved upwardly by the gripping conveyer as shown in Fig. 5. This takes place before the bunch-



ing roller has passed under the transferrer cylinder, that is to say, simultaneously with the commencement of the forward movement of the arms 240 the slack distributing device has operated and before the bunching roller has passed under the transferrer cylinder. During the bunching roller's forward movement the gripping conveyer will have been raised, placing its gripping jaws and the rolling apron directly beneath the pocket in the transferrer cylinder which has been oscillated or moved into the position shown in Fig. 5.

The means for operating the gripping conveyer are shown in detail in Figs. 10 and 11. In suitable bearings 262 secured to the side frames on each side (as shown in Fig. 1) is mounted to oscillate a shaft 263. Upon the main shaft 15 is secured a disk-cam 264, having the cam groove 265 in which a pin 267, Fig. 10 works, the pin being secured to a connecting rod 268, the lower end of which has a slot 269 which works upon the shaft 15, the slot forming a guide for the movement of the connecting rod 268 up and down. Upon the shaft 263 are secured two rocker arms 270, 271, the rocker 270 having a rearward extension 272 which is pivotally secured by a bolt or the like 273 to the upper portion of the connecting rod 268. The forward portions of the rockers 270, 271 have, connected by pins or bolts 274, links 275, which in turn are connected to the oscillating arms or levers 276 by the pins 277 to the levers fulcrumed at 278 to the main frame of the machine. The arms 276 lie within the connecting arms 240 at their upper ends and intercept the path of movement of the roller 241, as shown in Fig. 10, when the forward end of the levers 276 are in the position as shown in that figure. The forward ends of the levers 276 are provided with goosenecks or upwardly extending arms 279, and a rearward bend 280 between which extends the cross bar 281, which unites the forward ends together and upon which is mounted to rotate the roller 282.

Pivotally secured to the arms 279 at 283, Fig. 10, are two bell crank levers 284, the vertical arms of which are united by the cross bar 285 upon which is mounted the roller 286, the forward or horizontal arm of the bell crank levers being provided with two downwardly extending rods 287, which pass through the apertures in the cross bar 288, which extends between the brackets 235 of the rolling table, the lower portion of the rods carrying stops 289, said stops being adjustable up and down upon the rods 287 by means of a screw thread formed upon the rods and in the stop. The rearward arm of a bell crank lever 284 carries a spiral spring 290, the lower end of which is secured to a lug 291 on the forward end of the levers 276.

The operation is as follows: By timing the movement of the cam 265 and its operative connections with the levers 276, with the movements of the arms 240 and their operat-

ing elements, the rollers 282, 286 of the gripping conveyer jaws will be brought down below the path of movement of the bunching roller 241 prior to the time when said roller will have begun to move into the space occupied by the jaws of the conveyor and while said roller is moving the bunch to the forward end of the rolling table and also during its complete return movement. As before stated the initial forward movement of the arms 240 first operates the slack distributor in the manner before set forth and before the bunching roller 241 has reached the space occupied by the jaws of the gripping conveyer (when in the position shown in Figs. 5 and 10) the said jaws will have been moved upward by the levers 276 and their operating connections, during which time, and at all times except when in the position shown in Figs. 5 and 10, the two rollers 282 and 286, the one stationary and the other movable, will have been brought together by the stress of the spring 290 which has vibrated the bell crank levers 284 moving the roller 286 toward the roller 282, but during the upward movement of the outer end of the levers 276, and just as the rollers 282, 286 approach the under side of the transferrer cylinder, the stop 289 on the rod 287 strikes the under side of the cross bar 288 which prevents the further upward movement of the bell crank levers 284 and rollers, vibrating said levers forwardly against the stress of the spring 290, and separating the rollers, or, in other words, opening the jaws. By adjusting the stop 289 on the rod 287 the amount of movement of said rod can be limited or increased, thereby increasing or diminishing the amount of space to be created between the rollers 282, 286, and increasing or diminishing the width of the jaw and consequently the size of the pouch to be formed therein by the ejector plunger. The quicker action of the cam groove 265 draws down the lever 276 and with it the gripping jaws, which frees the stop 289 from contact with the cross bar 288 and permits the spring 290 to move the roller 286 rearwardly to the roller 282 closing the jaws, but prior to this downward movement of the gripping jaws, the plunger 204 of the transferrer cylinder has moved the conformed charge therein out of the pocket in the said cylinder down upon the roller apron 225 which extends across the rollers of the gripping jaws forcing the slack of the apron down in between and below the rollers, the plunger 204 being projected completely without the ejector cylinder down into and between the rollers and forming a pouch as shown in dotted lines in Fig. 5, the slack for which has been previously formed by the slack distributing device hereinbefore set forth. Now the downward movement of the gripping conveyer commences, the spring 290 bringing the two ends of the pouch formed in the apron lying over the rollers 282, 286, together, gripping them and forming a pouch



in which the formed charge is tightly held, and this movement of the levers 276 is continued until the jaws have been moved down below the path of movement of the roller 241. Now the charge is in position to be incased within the binder.

The rolling operation is as follows: The rearward end of the rolling table 224 is provided with a plate 291 which projects over the edge of the table, and below this is located a roller 292 mounted in suitable bearings 293 secured to the rear of the rolling table. At this time the rolling apron 225 lies flat upon the plate 291. The roller 241 is now moved forward by the arms 240, and as it approaches the vertical plane of the gripping conveyer, which lies below its path of movement, it engages the rolling apron 225 with its forward surface and begins to pull on the pouch containing the formed charge held by the gripping jaw. A continuation of the forward movement of the roller 241 withdraws the pouch and its contained charge from the gripping jaw against the stress of the spring 290, the pouch then being adjacent to the roller 292, the rolling apron being taut between its forward ends and the gripping jaw, and in fact taut all over. The pocket with its contained charge strikes the roller 292 which lifts it gently and without injuring the charge upon the plate 291, the apron lying flat therein as shown in Fig. 13, and upon which a suitable binder has been placed; the pouch or bight (as it has been otherwise called) then being moved forward, taking with it the charge, which is rolled between the apron, and as it strikes the binder, it is rolled upon or about it in the usual way, the continuation of the movement of the bunching roller 241 bringing the rolled charge down to the conveyer carriage now to be described.

As has already been stated two operators are used in the manipulation of this machine, one for placing the binder upon the rolling table and the other for taking the rolled filler or bunch from the conveyer carriage which last operator can also supply the feeding trough, or for which purpose a third operator can be used. The second operator or one who takes the bunch from the carriage places it into a mold, the structure and use of which are well known in the art, and when the mold is full the bunch is then taken and pressed into shape. The means employed for doing this and the operation thereof are as follows: To the brackets 234, Fig. 4, secured to the forward portion of the side frames 1 and also to a plate 232 secured to the forward portion of the rolling table 224 and extending some distance away from the front of the machine as shown in Fig. 3 is a track or guide way 233, having a dovetailed guiding surface as shown in cross section in Fig. 5. Upon this way is reciprocated a carriage 294 which has a dovetailed recess for engagement with the way 233. Extending upwardly from about the center of the carriage 294 is a lug 295 and

upwardly from the carriage is another lug 296, above which lies the plate spring 297 which receives the bunch from the bight of the bunching roller during its forward movement and holds it during the reciprocation of the carriage. This is accomplished as follows: The forward part of the carriage is provided with two apertured lugs 298 in which is adapted to play a rod 299, and about the rod lies a coil spring 300 which abuts against the lugs 298. One end of the rod 299 is secured to one end of a non-continuous rope or belt 301 which passes around the roller 302 journaled within a recess or opening 303 in the end of the guide way 233, thence rearwardly about the roller 304 journaled on a spindle 305 secured in any desirable way to the frame of the machine; thence forwardly to the upright arm 240 which carries the bunching roller 241 to which the side belt 301 is secured. The forward movement of the arm 240 at this side of the machine draws the carriage in front of the rolling table. The reverse action is secured by passing another non-continuous drive chain or belt 306 to the other end of the rod 299 as shown in Fig. 3, passing it over the roller 307 journaled within the extension of the guide way 233 from whence it passes toward the rolling table and about the roller 308 journaled on a spindle 309 mounted in the bracket 234 which is secured to the side frame 1, the belt then passing rearwardly to the other of the rocking arms 240 to which it is secured. As the arms move forward the belt 301 is drawn rearwardly moving the carriage toward the rolling table, the belt 306 during that movement giving up its length, while the belt 301 takes it up, and during the rearward movement the belt 306 then becomes the prime mover drawing the carriage away from the rolling table, the belt 301 then giving out its length, and in this way the carriage 294 is reciprocated back and forth upon its guide way 233. The spring 300 is used to soften the shock of the strain on the drive belts in either direction, compressing and giving the belts a chance to move a little after the carriage has ceased to move. A slack is formed in the apron by means of the mechanism shown in Figs. 12 and 13 after the bunching roller has passed under the transferrer cylinder and before the gripping mechanism begins to rise. The plunger in the oscillating transferrer cylinder does not commence to eject the charge from the pocket until after the jaws of the gripping device have been raised up and open, in which case the charge and the plunger operate the slack in the apron down into the jaws forming the pocket as shown in dotted lines as in Fig. 5. The apron operating device in Fig. 5 should be substituted for those shown in Figs. 12 and 13 as being the more desirable mechanism for forming the pocket in the gripping device. The abutment block 158<sup>a</sup> holds the charge in the pocket 198 until the pocket is in the position shown in Fig. 5, with the grip-



ping jaws directly beneath it to receive the bunch, so that at all of the movements the cut leaf is confined in place and the shape preserved.

5 In one complete revolution of the main driven shaft eight main operations are performed. The first operation is the feed, the next operation severing of the length of the filler. The third operation is the movement  
10 of the yielding plunger to deposit the cut charge into the pocket in the oscillating transferer. The next movement is the descending of the forming knives to cut and form the charge. The next operation is the movement  
15 of the ejector jaws for ejecting the dummy stock. The next movement is the oscillating of the transferer cylinder, and then the gripping or conveying jaws are raised and opened to take the charge from the cylinder pocket.  
20 Then the slack forming mechanism comes into play after the quarter oscillation of the transferer cylinder, and then the gripping jaws follow. Next the ejector plunger is moved down to discharge the filler into the apron  
25 and form a pouch in the apron within the jaws of the gripping device. Then the bunching roller moves forward carrying the charge in the bight formed in the apron and opening the jaws of the gripping device against the stress  
30 of the closing spring, the charge striking the roller at the end of the table where it takes the binder, the bunching roller carrying the bunch down to the carriage which is then reciprocated out of the way.

35 It must be obvious that many of the functions performed by my machine can be carried out by an arrangement of devices and combinations of elements, differing in structure and method of operation from those  
40 shown and described herein without departing from the spirit of my invention, and I therefore do not limit myself to the details of structure, nor to the specified combinations and sub-combinations of elements as the same  
45 can be carried out in many and various ways.

Having described my invention, I claim—

1. The herein described process of making cigar fillers, which consists in superimposing  
50 leaves of tobacco, feeding them endwise, severing the superposed leaves crosswise into charges of the desired length, confining the charge or charges against lateral or vertical movement, feeding such charge or charges of the cut leaf laterally while so confined, then  
55 cutting or paring said charge longitudinally of the leaf and giving the resultant filler a shape approximating that of the cigar to be produced, substantially as described.

2. In a cigar bunching machine, the combination of the following instrumentalities:  
60 the feeding trough and ironing device and means for intermittently moving stripped leaf in the trough and under the ironing device, a severing knife adapted to cut the train  
65 of leaf into charges of the desired length, means for feeding the tobacco from the ironing device to the severing knife, a confining

throat for receiving the charge, forming knives for shaping the charge, a plunger movable in the throat for moving the severed leaf  
70 under the forming knives, a binder wrapping device, and means for conveying the conformed charge to the said wrapping device, substantially as described.

3. In a bunching machine, the combination  
75 with the binder wrapping device, of a trough consisting of means for feeding a train of tobacco, a cutting knife adjacent to the trough, and operating means whereby the leaf is cut to the desired length, means for conforming  
80 the charge so cut to the proximate shape of the cigar to be produced, said conforming means lying in a plane substantially parallel with the trough, and at right angles to said cutting knife, and devices for conveying the  
85 conformed charge to the binder wrapping device, substantially as described.

4. In a cigar bunching machine, the combination of devices for feeding a train of superposed leaves, a knife adjacent thereto, and  
90 operating mechanism whereby a predetermined length of the superposed leaves is severed to the desired length, and cutting instrumentalities embodying means whereby the severed length of superposed leaves is  
95 conformed to the shape of the cigar to be produced, said cutting instrumentalities lying in a plane substantially parallel with said feeding devices, a rolling table and means for conveying the conformed charge from the  
100 forming knife to the rolling table, said means being arranged to prevent the leaves from displacement, substantially as described.

5. In a cigar bunching machine, the combination with a feeding trough, of a device for  
105 compressing and flattening out the leaf as it moves from the trough, a cutting knife, and means for giving an intermittent feed to the tobacco, and means for varying said feed, whereby a predetermined length of superposed  
110 leaves can be presented to the action of said cutting knife, forming blades arranged to conform the severed charge to the approximate shape of a cigar without compression, means for confining and feeding the severed  
115 charge from the severing knife to the forming blades, a rolling table, and means for conveying the conformed charge to the rolling table where it is to be incased within a binder, substantially as described.  
120

6. In a cigar bunching machine, the combination with a feeding device adapted to move a stream of superposed leaves, a severing knife and a variable speed mechanism, arranged to operate said feeding device whereby  
125 a predetermined length of superposed leaves can be presented under the severing knife, a throat or passage way for receiving and confining the charge and restraining the leaves from displacement, a forming blade for shaping  
130 the charge, and an ejector cylinder having a pocket, an automatically and independently operated plunger movable in the throat forming means for moving the severed charge



from the throat under the forming blade and into the pocket of the ejector cylinder where it is held during the operation of conforming the charge, a rolling table, and apron, and means for operating the same, to roll the charge within a binder, and devices for moving the conformed charge from the ejector cylinder into the rolling apron and incasing it within a suitable binder, substantially as described.

7. In a cigar bunching machine the combination of devices for rolling a bunch, comprising a stationary rolling table, an apron, a bunching roller and means for operating said roller, with a forming blade for giving the filler the proximate shape of the cigar, and means for presenting a length of superposed leaves to the forming blade, and devices for moving the conformed charge from the forming blade to the rolling devices, and means for ejecting the charge from said charge moving device, substantially as described.

8. In a cigar bunching machine, the combination with a suitable rolling mechanism, of devices for feeding tobacco, a severing knife, means for giving said feed a variable movement in accordance with the desired length of the bunch, a forming blade and devices for feeding the charge to the rolling mechanism, substantially as described.

9. In a bunching machine, the combination with the feeding trough, and the severing knife, of a confining passage leading from the trough to the said knife, said knife lying at the end of said passage, and a throat leading at right angles from said trough, and means for passing the tobacco through said throat, and means for rolling a bunch, substantially as described.

10. In a feeding trough for a cigar bunching machine, the combination of a series of movable belts, said belts being arranged to form a gradually opening trough, at the contracted end of which the tobacco is received, one of the belts forming a movable bottom for the trough, and means for operating said belts, substantially as described.

11. In a feeding device for a bunching machine, the combination of fixed abutments and movable belts defining the sides and bottom of a trough the side belts being disposed at an angle to the line of feed, and angularly disposed pulleys located at the mouth of the said trough, the belts being farther apart at one end than at the opposite end, a transversely located pulley also located at the mouth of said trough, and belts movable about said pulleys lying within and above said abutments, means for rotatively supporting the other end of said pulleys, and devices for operating the pulleys, substantially as described.

12. In a feeding device for a cigar bunching machine, the combination of a plurality of movable belts defining the sides and bottom of a trough, an extension to said trough, means

for guiding the movements of the tobacco leaf from said trough to said extension, and a deflecting and compressing device located at the mouth of said extension and adapted to direct the leaf from the trough into said extension, and means for feeding the leaf through the compressing device, substantially as described.

13. The combination, in a cigar bunching machine, of a feeding device comprising two sections, one a feeding trough, having a plurality of movable belts adapted to move the tobacco forward, the other adapted to continue the movement of the said tobacco, having a narrowed passageway therethrough, and movable means for confining the tobacco vertically, and an angularly disposed deflector located at the mouth of the said contracted section, and means for operating the movable portions of said sections, substantially as described.

14. In a cigar bunching machine, an ironing mechanism comprising a plurality of movable belts horizontally disposed, one of said belts having a fixed support or bed over which it travels, the superposed belt having a yielding pressure device bearing thereon, and means for moving the belts, substantially as described.

15. In an ironing table for a cigar bunching machine, the combination with a lower belt movable over a fixed support or bed, a second belt movably supported over the lower one, and a yielding compressing device comprising a series of interlocked rollers adapted to bear upon the upper belt and located over said support or bed, a frame for supporting said interlocked rollers, and means for yieldingly pressing said rollers upon the belt and for moving the belt, substantially as described.

16. The combination in an ironing table for a cigar bunching machine, of the bed plate 71, the belt 69 movably supported and disposed above said table, an upper movable belt, pulleys for the same suitably mounted, and a frame carrying a plurality of interlocked rollers journaled in the frame, said frame and rollers being supported over and upon the upper belt, and a supplementary roller loosely mounted in said frame and bearing on said rollers, and means for yieldingly pressing said supplemental roller upon the interlocked rollers, substantially as described.

17. The combination of the lower movable belt and bed thereof, of the upper belt, and a yielding supported frame supported over the lower portion of said upper belt and having a series of interlocked rollers journaled therein, the two belts forming a passageway between them, and yielding devices permitting the upper belt and interlocked rollers to move to and from said lower belt without relieving their pressure upon the passing tobacco leaf, substantially as described.

18. The combination in an ironing device for a cigar bunching machine, of the lower



movable belt and its bed, of the upper movable belt, both belts being disposed to form a passageway between them, fixed side plates defining the sides of said passageway, the frame plates 78, 79, the roller 82 movably supported in the frame plates, a series of interlocking rollers 81, a spring 83 secured at one end to the spindle of the roller 82, the other end being fixed, said roller bearing on the interlocked rollers, substantially as described.

19. In an ironing device for a cigar bunching machine, the combination of the two moving belts whose opposing faces move in the same direction and adjusted to form a passageway between them, one being superposed above the other, a fixed bed plate for the lower belt, a series of freely mounted pressure rollers bearing upon the upper belt, and means for maintaining a downward pressure upon said pressure rollers, substantially as described.

20. In a feeding device for a cigar bunching machine, the combination of the feeding trough having a plurality of movable belts defining the sides and bottom of said trough, and an ironing device comprising the movable belts adjusted to form a passageway between them, and a pressing device adapted to bear upon the upper of said last mentioned belts with a yielding pressure, substantially as described.

21. In a cigar bunching machine the combination with the feeding device adapted to move or convey tobacco, and means for giving an intermittent feed to said device, said means comprising a suitably operated pawl lever and a series of intermeshed wheels, a ratchet mechanism for said wheels, a rocking lever, a connecting rod extending between said ratchet mechanism and the rocking lever, said connection being adjustable on said rocking lever to vary the throw of said ratchet mechanism to alter the feed when desired and means for connecting the intermeshed gear with the feeding device, substantially as described.

22. In a cigar bunching machine, the combination with a feeding device of means for intermittently and variably operating said feeding device, comprising the bell crank lever 20, suitably supported and actuated, the upper arm of said lever having a slot a stud movable in said slot, the spindle 24 having the ratchet wheel 26 thereon, the arm 25 movably supported upon said spindle and having a pawl, suitable reducing gear and connections between the ratchet wheel 26 and the feeding device, and the connecting rod 28 extending between the arm or rocker 25 and the stud 29, substantially as described.

23. In a cigar bunching machine the combination with means for feeding the tobacco, of a charge severing knife, and a guide or standard for the same, means for operating said knife, an inclosed throat extending transversely of the tobacco feeding means, one side of which is defined by said knife or its

standard, said throat being adapted to receive the severed charge, and means for passing the severed charge transversely to the tobacco feeding means, substantially as described.

24. The combination in a cigar bunching machine of a knife standard or guide having a passage way, a movable charge severing knife in the standard, aligned with said passageway, an inclosed throat extending across the line of feed adapted to receive the severed charge, means for adjusting the width of the throat, a tobacco feeding device, and devices for varying the amount of movement of the feeding device to lengthen or shorten the amount of tobacco presented under the charge severing knife, substantially as described.

25. In a cigar bunching machine, the combination of the feeding device, the severing knife, the inclosed throat adapted to receive the severed charge, said throat extending transversely to the feeding device, a plunger movable in said throat, a rolling table, means for operating the plunger, means for conveying the severed charge from the throat to the rolling table, and means whereby the movement of the plunger toward the rolling table is accomplished independently of the device which moves it from the rolling table, substantially as described.

26. The combination, in a cigar bunching machine, of the charge receiving throat adapted to contain the severed charge of tobacco, a plunger, a device for reciprocating said plunger in the throat, said device consisting of means for giving the plunger a forward movement and separate means for giving the plunger a rearward movement, and a forming blade at the end of the throat, substantially as described.

27. The combination with the inclosed throat adapted to receive the severed charge of tobacco, the plunger movable in said throat, and devices for moving the plunger forwardly and rearwardly in said throat, said devices consisting of independent means arranged to render the forward movement of the plunger in the throat independent of its rearward motion, and a stop for regulating the time of commencement of the rearward movement of the plunger, substantially as described.

28. In a cigar bunching machine, the combination with a movable knife carrying cutting blades arranged to conform to a section or sections of the exterior contour of a cigar to be produced, said blades being arranged back to back, of means for intermittently feeding a train of charges of leaves under the blades, and a shearing block for sustaining a charge of leaves during the act of cutting the same, substantially as described.

29. In a cigar bunching machine, the combination with a charge severing knife and the inclosed throat adapted to contain a charge of superposed leaves, means for transferring the charge in the throat, said means being



arranged to permit a greater or less amount of the charge to be moved, a shearing block located at the end of the said throat and adapted to support a portion of the leaf charge, a forming knife having cutting instrumentalities conforming to a section or sections of the exterior contour of the cigar, and being located at the end of said throat, and means for retreating the said knife synchronously with the movement of the train of charges thereunder, substantially as described.

30. In a cigar bunching machine, the combination with the inclosed throat, a receiving pocket adapted to be aligned with the opening in the throat, an abutment block between the end of the throat and the opening to the pocket, means for advancing a charge of leaf in the throat, and a forming knife formed in sections approximating the sides of a cigar and placed back to back and adapted to sever the charge lying in the pocket from that lying in the throat, said knife being arranged to sever the charge on lines conforming to the semi exterior contour of the cigar, said lines being reversed, substantially as described.

31. In a cigar bunching machine, the combination of the following instrumentalities: a confining throat, means for moving a charge of leaf within the throat, a pocket aligning with the end of the throat, both the pocket and the throat sustaining a portion of the said charge, and cutting instrumentalities having reversed blades, one blade being arranged to conform the tobacco in the pocket to one section of the exterior contour of a cigar, and the other blade arranged to conform the front end of the charge in the throat to the reversed section of a cigar, and means for removing the waste stock from between the severed portions of the charge, the conforming instrumentalities being located between the throat and the pocket, substantially as described.

32. The combination in a cigar bunching machine, of the throat, a plunger movable in the throat, a movable pocket located on the plane of the throat and arranged to be aligned with the front of the throat, means for increasing or diminishing the depth of the pocket, the throat and pocket being arranged together to sustain a charge, the said plunger being adapted to move a charge of leaf from the throat to the pocket, cutting instrumentalities for severing the charge, and a shearing block located between the end of the throat and the pocket, substantially as described.

33. The combination in a cigar bunching machine, of the throat, a plunger movable in the throat, a movable pocket located on the plane of the throat and arranged to be aligned with the front of the throat, means for increasing or diminishing the depth of the pocket, the throat and pocket being arranged together to sustain a charge, the said plunger being adapted to move a charge of leaf from the throat to the pocket, cutting instrumen-

talities for severing the charge, and a shearing block located between the end of the throat and the pocket, substantially as described.

34. In a cigar bunching machine, the combination with the forming knife consisting of a pair of cutting blades reversely disposed to leave vertical spaces between their ends, and a slide rest for supporting the cutting blades in their up and down movement, and a cutting block adjacent to said knife, of a pair of independently operated ejecting and gripping jaws in line with said knife and means for supporting them, the jaws comprising upper and lower members, means for vibrating both jaws, the upper members of which are adapted to lie within the space between the cutting blades, the members of each of the jaws being movable independently of the other and arranged to receive the leaf between them, support it or a portion thereof during the act of cutting or forming the same, and means for vibrating the jaws to grip and eject the gore of stock lying between the cutting blades, substantially as described.

35. In a cigar bunching machine, the combination with two juxtaposed conforming knife blades, both reversely curved and leaving vertical spaces between their ends, means for raising and lowering the knife blades and guiding them, a cutting block and pocket aligned with each other and the independently operated gripping and ejecting jaws located in line with said knife blades and arranged to remove the gore of stock left between the blades by the cutting action thereof, and means for independently operating the gripping jaws, substantially as described.

36. In a cigar bunching machine, the combination with the inclosed throat, of the oscillating transferrer cylinder having a pocket therein, a plunger arranged to work in said pocket, and means for moving the charge in said throat and into the pocket of the transferrer cylinder, and a forming knife adapted to sever the charge and leave a portion thereof in the said pocket, a cutting block adjacent to said knife, a rolling apron and means for oscillating the cylinder and operating the plunger to eject the leaf from the pocket and onto the apron, substantially as described.

37. In a cigar bunching machine, the combination with the pocketed oscillatory transferrer cylinder, means for moving the charge of leaf into the pocket in said cylinder and conforming said leaf, the forming means being located in line with the pocket, a rolling apron and means for operating it, said apron being adapted to be moved to and from said cylinder, a gripping conveyer having a jaw, means for raising said conveyer, and means for oscillating the cylinder, and means for ejecting the charge from the pocket therein and onto the apron for forming a receiving pouch therewith between the jaws of the said gripping conveyer, substantially as described.



38. In a cigar bunching machine, the combination with the gripping conveyer comprising a vibrational frame carrying at one end a plurality of opposing jaws one of which is  
 5 spring operated, said jaws being upwardly movable and means for so moving said jaws, a rolling apron adapted to be raised by said frame and to lie upon said jaws, means for expanding the jaws during the upward move-  
 10 ment of the frame, and means for conveying a cut charge of tobacco leaf from a suitable source of supply to and within the pouch between the distended jaws, and means for forming said pouch, substantially as described.

39. The combination in a cigar bunching machine of a rolling apron fast at its forward end and movably supported at its rear end to a resiliently opposed lever, a bunching roller, and means for operating it, a vibrational  
 20 frame adapted to be impinged against the rolling apron, a swinging dog adapted to be brought in contact with the above mentioned lever, means for freeing the dog from said lever, and means for vibrating said lever  
 25 against the stress of the spring, substantially as described.

40. In a cigar bunching machine, the combination of the following instrumentalities: an oscillatory pocketed cylinder, a plunger  
 30 movable in said pocket, means for oscillating the cylinder and moving the plunger in said pocket, a rolling table and a rolling apron fixed at the forward end of the rolling table and movably connected at its rear end, a vi-  
 35 brational lever loosely connected with the rear end of said rolling apron, a gripping conveyer having expanding jaws adapted to elevate the rolling apron up to the pocket of the ejector cylinder, means for opening the jaws  
 40 of said gripping conveyer, the ejector plunger being adapted during its ejecting movement to form a pouch between the said jaws, the means for operating said gripping conveyer being adapted to vibrate the jaws away from  
 45 the said pocket, an apron roller adapted to be moved forwardly to draw the pouch and its contents out from the said jaws, a device for distributing the slack in said rolling apron and means for giving the ejector cylinder, its  
 50 plunger, the gripping conveyer, apron roller, and the slack distributor, their proper coactive movements one in relation to the other, substantially as described.

41. In a cigar bunching machine, the combination with the inclosed throat and its plunger movable therein, the pocketed cylinder adapted to be oscillated in front of the opening in said throat to intermittently align the pocket in the cylinder with the opening in  
 55 the throat, a rolling table, a rolling apron suitably secured, the vibrational gripping conveyer adapted to receive the charge from the cylinder pocket, means for forming a pouch therein, and further means for lowering the  
 60 gripping conveyer to an operative level with the rolling table, and further means for freeing the pouch and its contained charge from

the gripping conveyer, and rolling the charge within a suitable binder, substantially as described.

42. In a cigar bunching machine, the combination with the rolling table of the rolling apron fixedly secured at the forward part of the table and movably secured at its rear, means for tightening and loosening the free  
 75 end of the apron, the bunching roller supporting the rear portion of the apron and adapted to move the bight in the apron forwardly along the rolling table, means for vibrating the bunching roller, a vibrational frame carrying  
 80 movable gripping jaws adapted to cross the path of movement of the bunching roller, means for raising said frame, means for forming the apron into a receiving pouch between said jaws and placing a quantity of tobacco  
 85 therein, and means for lowering the said jaws below the path of movement of the bunching roller prior to the said roller's forward movement, substantially as described.

43. In a cigar bunching machine, the combination with a suitable rolling table and a  
 90 rolling apron fixed thereto at one end and movably secured at its rear, a bunching roller adapted to move a bight in the apron upon the rolling table, and means for vibrating  
 95 it forwardly and rearwardly, a vibrational frame carrying distensible gripping jaws, a device for conveying a cut charge of tobacco leaf from a source of supply, means for moving the gripper frame to and from said de-  
 100 vice, the jaws of the gripping frame traversing the path of movement of the bunching roller, and means for forming the apron into a pouch within the jaws of the gripper frame and depositing the cut filler therein, and  
 105 means for drawing the slack of the apron to the rear thereof whereby the length of the apron necessary for the formation of the pouch is obtained at the rear end of the apron, substantially as set forth and described.

44. The process of making cigar fillers consisting in superimposing leaves of tobacco, ironing the superimposed leaves to compact them, severing the superimposed leaves cross-  
 115 wise into charges of the length of a cigar filler, confining the charge or charges against outward movement, feeding of the charge laterally while so confined, and then cutting the fed charge lengthwise of the leaf to give an approximate shape of a cigar to the filler, sub-  
 120 stantially as described.

45. The process of making cigar fillers, consisting in feeding tobacco leaves in the direction of their length, then cutting charges on lines transversely to the length of the leaves  
 125 and then cutting fillers from said charges in the direction of the length of the leaves, whereby fillers having longitudinally extending leaves are produced, substantially as described.

46. The process of making cigar fillers, consisting in feeding a series of leaves in the direction of their length, then severing the same on transverse lines to form charges, then feed-



ing said charges, under pressure, in a train, and then severing said charges in the longitudinal length of said leaves, to form long filler bunches, substantially as described.

5 47. A device for feeding tobacco leaves, consisting of a horizontally disposed traveling belt, a pair of belts placed on edge over the horizontal belt, and a horizontal belt so located as to form a passage between them in  
10 advance of said vertical belts, combined with a severing knife adjacent to the passage to receive tobacco therefrom, and means for actuating said belts and said knife, substantially as described.

15 48. A feeding trough consisting of a horizontal belt, two endless belts placed on edge thereover, pulleys receiving said belts, certain of said pulleys carrying intermeshed gear wheels, combined with an ironing device  
20 comprising compressing devices located over the horizontal belt, and a charge severing knife, and means for operating said parts, in the manner as and for the purposes specified.

25 49. A feeding trough consisting of traveling belts combined with a deflector composed of a wedge shaped body, a spring acting tongue carrying said body, and an ironing device adjacent to said deflector, said deflector acting to guide leaves to said ironing device, substantially as described.

30 50. The combination of a horizontal feeding belt, and means for actuating it, with a superposed similarly disposed endless belt, rollers carrying said belt, a series of pressure  
35 rollers located within the web of said belt, one of said rollers having means to press it in the series on the other rollers and also in contact with said belt to take up slack therein, substantially as described.

40 51. The combination of a horizontal feeding belt and a pair of vertical belts, rollers around which the latter belts pass, intermeshed gears connected with said rollers, a band for turning one of said rollers, a pulley  
45 receiving said band, a shaft carrying said pulley, a crank arm, means for moving it, and means for connecting said pulley shaft with said crank arm, as and for the purposes specified.

50 52. The combination of a horizontal feeding belt, pulleys over which it passes, a pair of vertical belts over said horizontal belt, pulleys for guiding said vertical belts, gears for moving said vertical belts synchronously,  
55 a horizontal belt over the first mentioned belt, pulleys for guiding said belt, a shaft carrying one of said pulleys and another pulley on said shaft, a band connecting said last mentioned pulley with a pulley of one of the  
60 vertical belts, the pulley shafts of the horizontal belts being geared together, and means for operating said shafts, whereby all of the belts are moved synchronously, substantially as described.

65 53. The combination of synchronously movable feeding belts and means for thus actuating them, a severing knife located trans-

versely to said belts and adjacent to their corresponding ends, means for actuating said knife, a throat extending parallel to said  
70 knife and transversely to said belts, a plunger in said throat, and means for moving said plunger, substantially as described.

54. The combination of a severing knife and means for feeding tobacco to and under  
75 it, with a throat contiguous to said knife, a plunger in said throat, a self acting device for moving said plunger forwardly and means independent thereof for retracting said plunger, as and for the purposes specified.

80 55. The combination of a severing knife and means for feeding tobacco under it, with a throat contiguous to said knife, a plunger in said throat, a device for moving said plunger forward, and positively acting devices for  
85 retracting said plunger, as and for the purposes specified.

56. The combination of a severing knife and means for feeding tobacco to it, with a throat contiguous to said knife, a plunger in  
90 said throat, a rod connected with said plunger, a collar or projection on said rod, means for moving said rod and plunger forwardly, a cross head in advance of said collar or projection, and devices for moving said cross  
95 head so as to act on said collar or projection to retract said plunger, substantially as described.

57. The combination of a severing knife and means for feeding tobacco to it, a throat  
100 adjacent thereto, a plunger in said throat, a rod connected with said plunger, a pulley suitably supported, a flexible connection extending from said rod over said pulley and having a weight at the end thereof whereby  
105 said plunger and rod will be moved forward by said weight, and an independently actuated device for retracting said plunger, substantially as described.

58. The combination of a severing knife  
110 and means for feeding tobacco to it, with a throat having one side open adjacent to said knife, a plunger in said throat, a rod connected with said plunger and self-acting devices connected with said rod for moving it  
115 forwardly, and with a cross head, a collar or projection on said rod for engagement with said cross head, arms pivoted to said cross head, a cam and intermediate devices connecting said arms with said cam whereby said  
120 cross head will be moved independently of the devices that move the plunger forward, for retracting said plunger, substantially as described.

59. The combination of a severing knife  
125 and means for feeding tobacco to it, with a throat having both ends open, and an opening in one side in line with said knife, a plunger in said throat, and devices for reciprocating said plunger, substantially as described.

60. The combination with the throat and means for feeding tobacco to and from it, of a rotative transfer cylinder having a pocket to align with said throat, a cutter between



said throat and said cylinder, a plunger in the pocket of said cylinder, means for normally holding said plunger retracted, and means for advancing said plunger to eject tobacco from said pocket, and a rolling apron and rolling devices located beneath said cylinder to receive the charge and roll the bunch, substantially as described.

61. The combination of a throat, and means for feeding tobacco to and from it, with a transferrer cylinder having a longitudinally curved face, and a pocket, a plunger in said pocket, a cutter between the throat and said cylinder, a block having a curved face corresponding to the longitudinal periphery of said cylinder, and means for turning said cylinder as and for the purposes specified.

62. The combination of a throat and means for feeding tobacco to and from it, and a cutting block at one end of said throat, said cutting block having the approximate shape of one side of a cigar, with a forming knife made of blades, one of said blades corresponding to the shape of said cutting edge, the opposite of said blades corresponding to the reverse side of the cigar, and a transferrer cylinder in line with said throat, said knife working between said throat and said cylinder, substantially as described.

63. The combination of a throat and means for feeding tobacco to and from it, with a charge-receiving cylinder, an ejector therein, a reciprocating slide, a forming knife, and means for detachably connecting said knife with said slide, said knife consisting of blades in the approximate shape of opposing sides of a cigar, said blades being placed back to back, and means for turning said cylinder, substantially as described.

64. The combination of a throat and means for feeding tobacco to and from it, with a forming knife composed of two curved sections placed back to back and means for operating said knife, substantially as described.

65. A forming knife for cigars consisting of two suitably curved blades placed back to back and a reciprocating element carrying said blades, substantially as described.

66. A forming knife for cigars consisting of two concavo-convex blades having their convex portions opposed, and a reciprocating element carrying said blades, substantially as described.

67. A tobacco feeding throat and a forming knife, combined with a pair of gripping jaws located in line with said knife, a shaft for carrying and turning said jaws, a spring for holding said jaws in the normal positions, and a stop to engage one of said jaws to cause said jaws to separate to eject the tobacco held thereby, substantially as described.

68. The combination of a tobacco feeding throat and a forming knife, with a pair of gripping jaws, in line with said knife, a shaft carrying said jaws and means for turning said shaft, a spring for holding said jaws in their normal positions, a projection carried by one

of said jaws, and a stop to be engaged by said projection to separate said jaws, substantially as described.

69. The combination of a tobacco feeding throat, a forming knife and means to operate it, with a pair of jaws in line with said knife, a spindle carrying said jaws, one of said jaws having a projection 176, a lug 177, a set screw 178 and a lug 183, the other jaw having an arm 180, a spring 181 and a projection 182 to be engaged by the lug 183, and means for turning said spindle to operate said jaws, as and for the purposes specified.

70. The combination of a tobacco feeding throat and a forming knife, with a pair of jaws, a spindle carrying them, a crank arm on said spindle and means for operating said crank, with a spring to keep said jaws in their normal positions and a lug to be engaged by one of said jaws to separate said jaws, substantially as described.

71. The combination of a tobacco feeding throat having a cutting block conformed to the approximate side of a cigar, with a forming knife having blades conforming to the approximate sides of a cigar, one of said blades corresponding in position to said cutting block, with a transferrer cylinder having a pocket and its side conformed to the approximate shape of the side of a cigar and corresponding in position to the other of said sections of the forming knife, and means for operating said knife and for turning said cylinder, and an ejector in the pocket of said cylinder, substantially as described.

72. The combination of a charge forming device, with a rolling apron, a rolling table, a spring actuated lever 228, to which said apron is connected, a bunching roller, an arm carrying it, and a projection or roller carried by said arm to act on said lever 228 to loosen the belt, and means for vibrating said bunching roller across said table, substantially as described.

73. The combination of a charge forming device, with a rolling apron, a rolling table, a spring actuated lever 228 having a curved portion, said apron being connected with said lever, a bunching roller, an arm carrying said roller, and a projection or roller carried by said arm to act on the curved portion of said lever, and means for vibrating said bunching roller across said table, as and for the purposes specified.

74. The combination of a charge forming device, with a rolling apron, a rolling table, a spring actuated lever 228 to which it is connected, a bunching roller, an arm carrying said roller, and a projection or bar carried by said arm for raising said lever, a slack distributing device consisting of a frame having a bar 250 to engage the apron, and a dog or hook to engage the lever 228 to tilt said frame and bar 250, and means for vibrating said bunching roller across said table, as and for the purposes specified.

75. The combination of a charge forming



device, with a rolling apron, a rolling table,  
 a lever 228 with which said apron is con-  
 nected, a bunching roller, an arm carrying  
 said roller, a pivoted frame having a bar 250,  
 5 to act on said apron, a dog or hook carried  
 by said frame and arranged to be engaged by  
 said lever, a stop to disengage said dog or  
 hook from said lever, a spring to actuate said  
 frame, and means for vibrating said bunch-  
 10 ing roller across said table, substantially as  
 described.

76. The combination of a rolling apron,  
 and means for forming a bight or pouch there-  
 in, with a gripping conveyer to receive the  
 15 bight of said apron consisting of a pair of  
 levers 276 and a bar or roller connecting them,  
 bell cranks pivoted on said levers and a bar  
 or roller connecting said bell cranks, means  
 for raising or lowering said levers 276, and  
 20 devices for independently operating said bell  
 cranks, as and for the purposes specified.

77. The combination of a rolling apron, and  
 means for forming a bight or pouch therein,  
 with a gripping conveyer to receive the bight  
 25 of said apron, and consisting of a pair of le-  
 vers, a cross bar or roller connecting them,  
 means for raising and lowering said levers,  
 bell cranks pivoted to said levers, a cross bar  
 or roller connecting said bell-cranks, a spring

connecting one of said bell cranks with one 30  
 of said levers, and a stop rod connecting one  
 of said bell cranks with a stationary element  
 to move said bell cranks against the stress of  
 said spring, as and for the purposes specified.

78. The combination of a rolling apron, and 35  
 a bunching roller with a gripping conveyer  
 consisting of levers 276, having upturned por-  
 tions with rearward bends 280, a bar or roller  
 connecting said bends, bell cranks pivoted  
 on said levers, a bar or roller connecting said 40  
 bell cranks, said bars or rollers forming a  
 gripping jaw, and means for operating said  
 bell crank, and means for raising and lower-  
 ing the levers 276 to draw down a bight in  
 the apron, as and for the purposes specified. 45

79. The combination of a rolling apron and  
 its table, with a bunch receiving carriage ex-  
 tending transversely of said table, a cush-  
 ioned-rod connected with said carriage, belts  
 connected with opposite ends of said rod, and 50  
 means for actuating said belts, substantially  
 as described.

Signed at the city, county, and State of New  
 York, this 6th day of July, 1893.

HENRY K. GARDNER.

Witnesses:

B. S. WISE,  
 JOSEPH L. LEVY.