

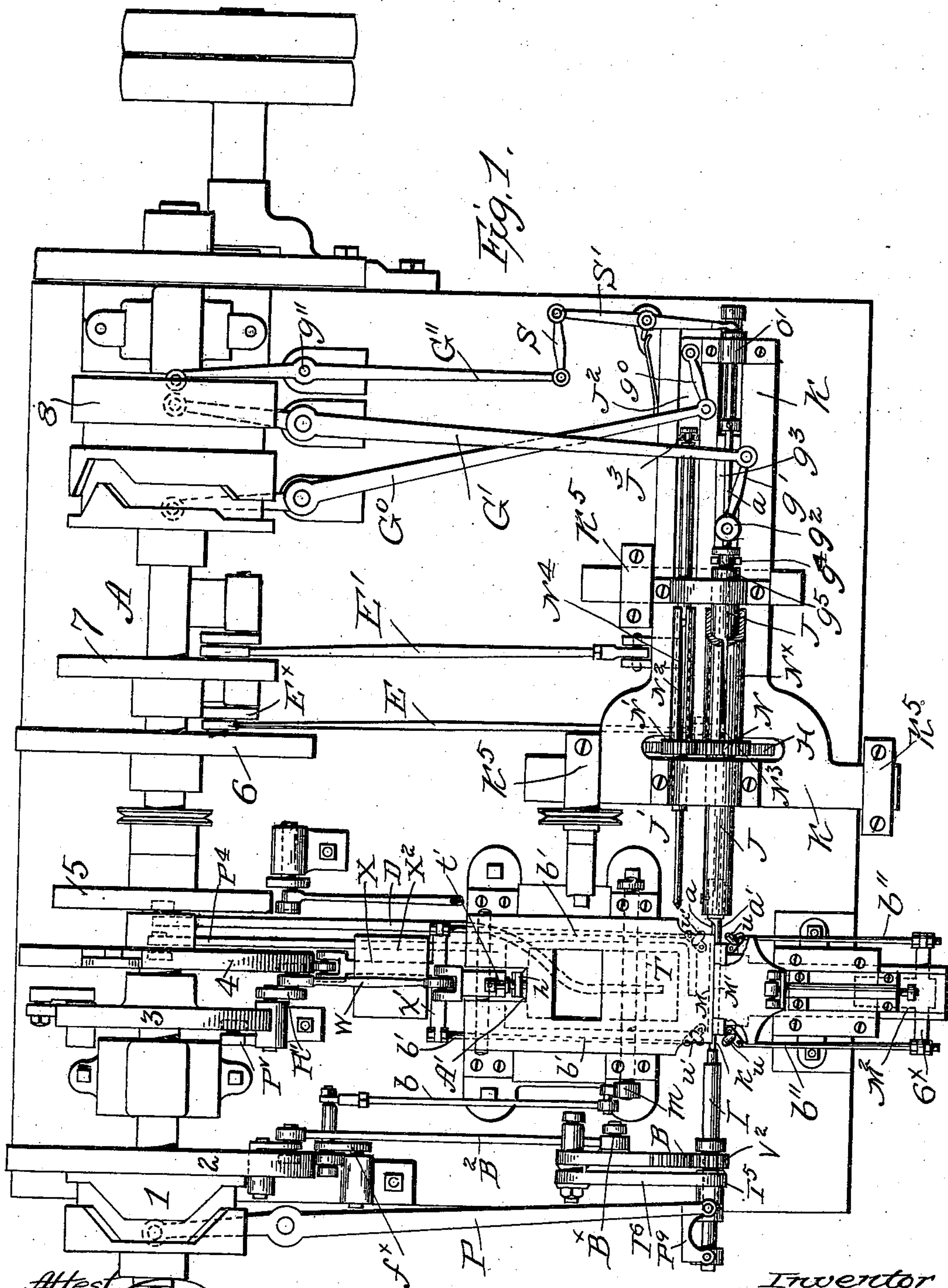
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9 Sheets—Sheet 1.

V. S. FOMBUENA.  
CIGARETTE MACHINE.

No. 501,498.

Patented July 18, 1893.



Attest  
 Marion Macdonald  
 F. L. Middleton

Inventor  
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by Richards & Co  
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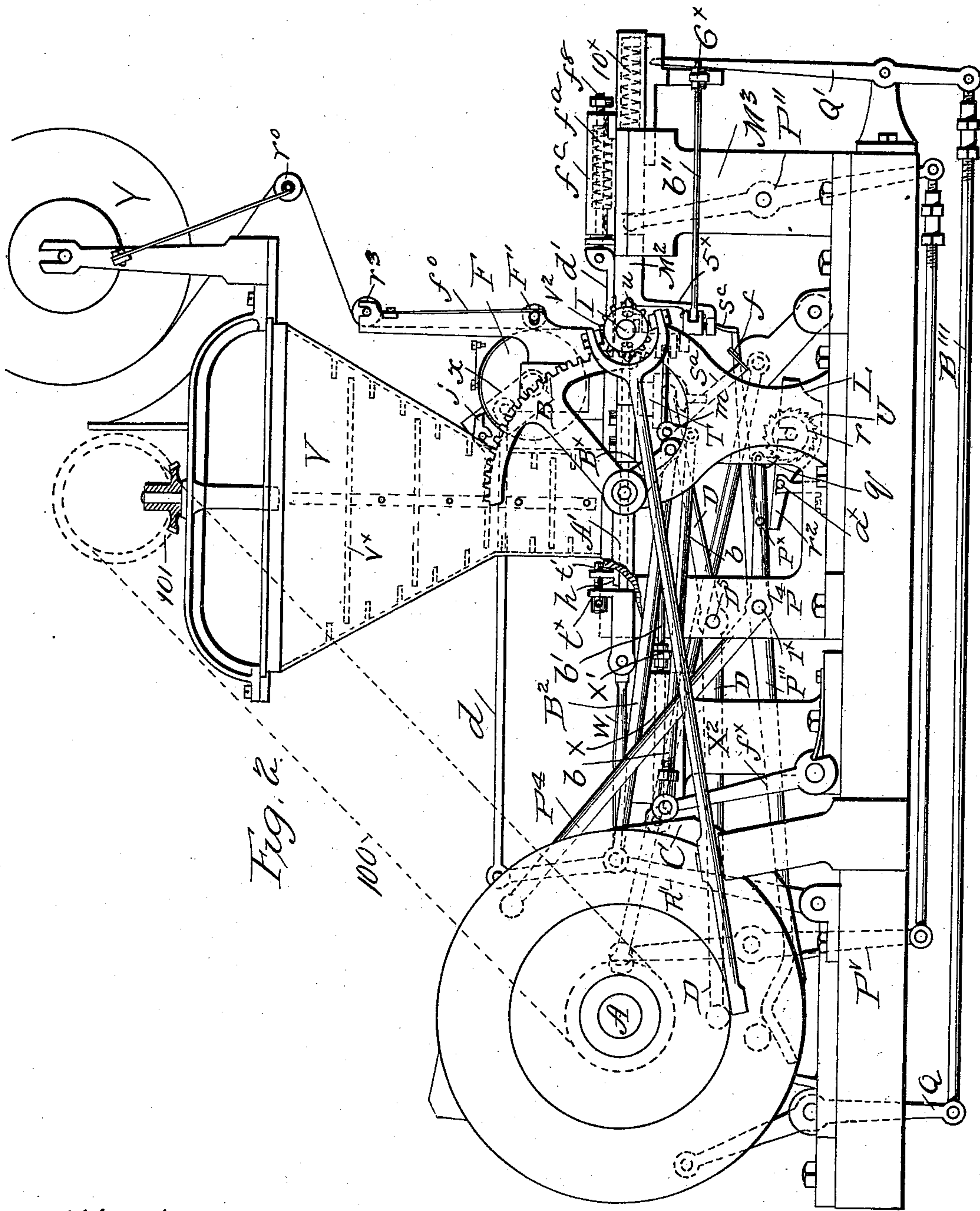
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9 Sheets—Sheet 2.

V. S. FOMBUENA.  
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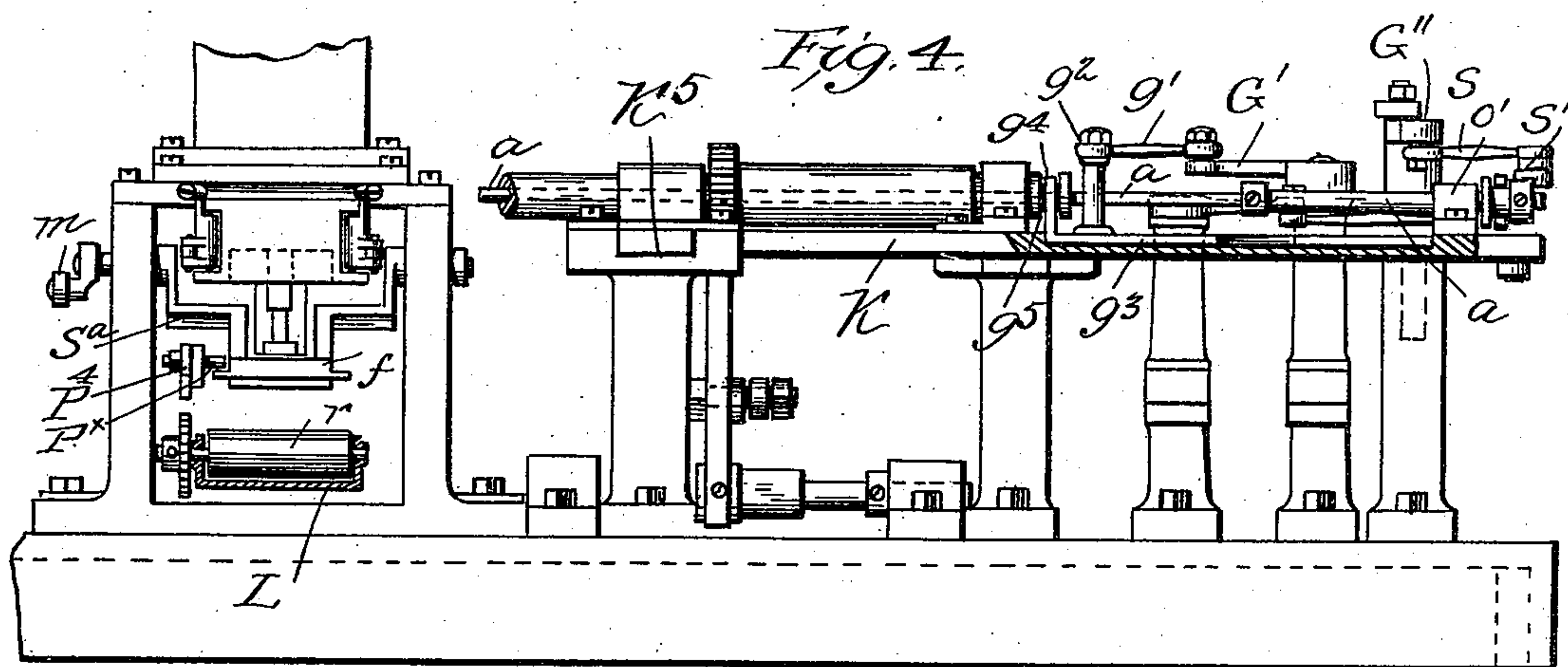
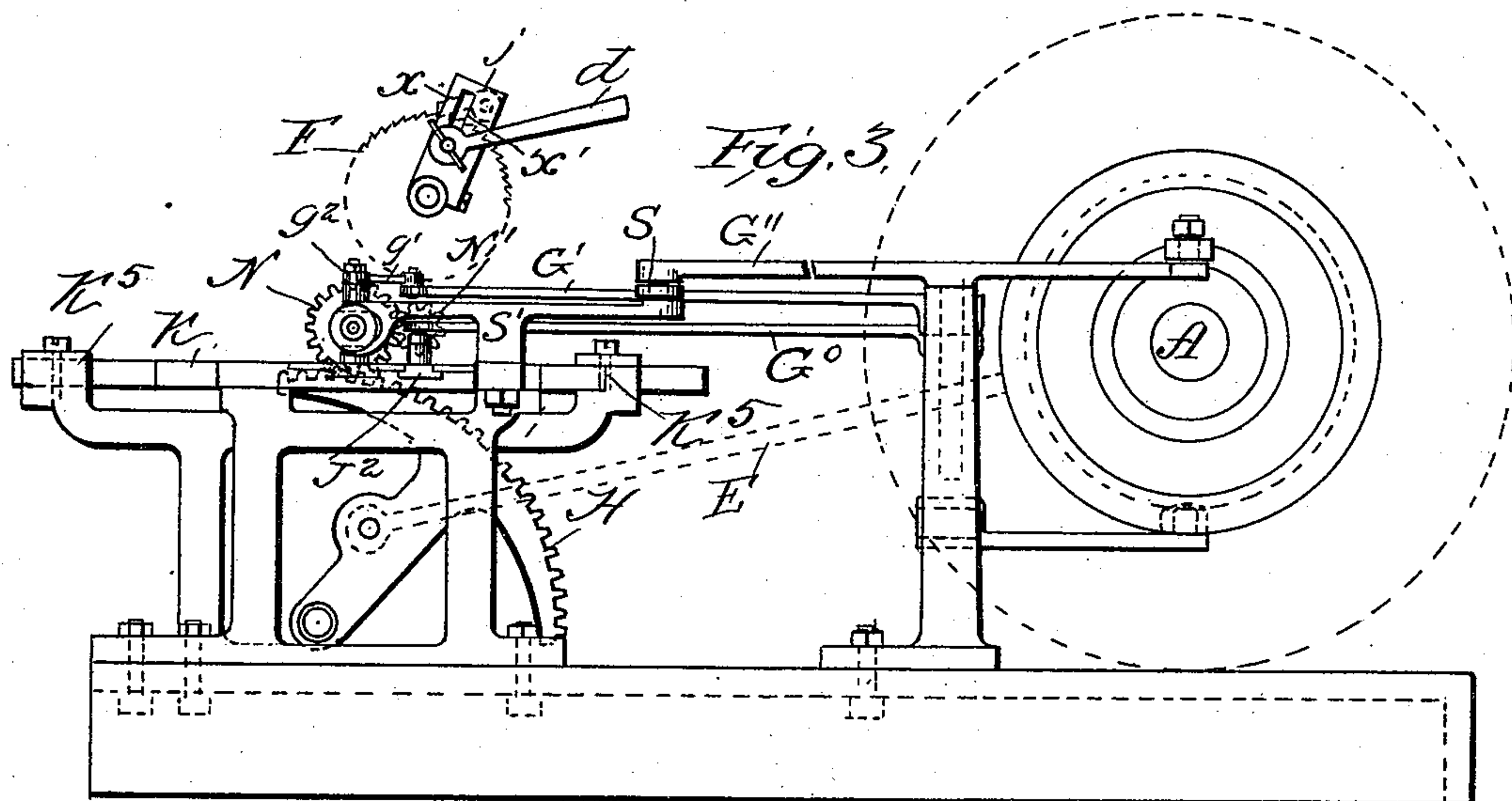
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V. S. FOMBUENA.  
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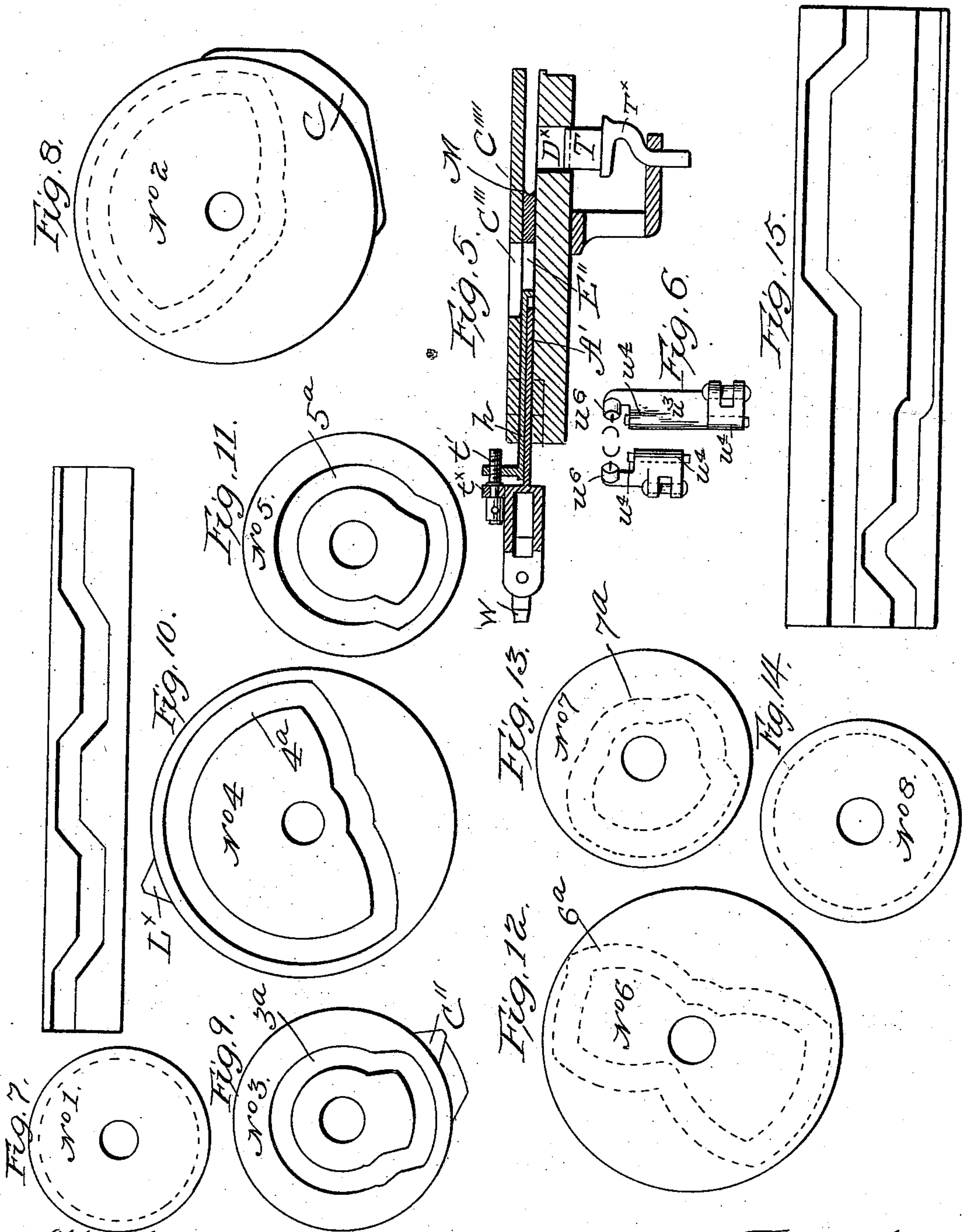
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9 Sheets—Sheet 4.

V. S. FOMBUENA.  
CIGARETTE MACHINE.

No. 501,498.

Patented July 18, 1893.



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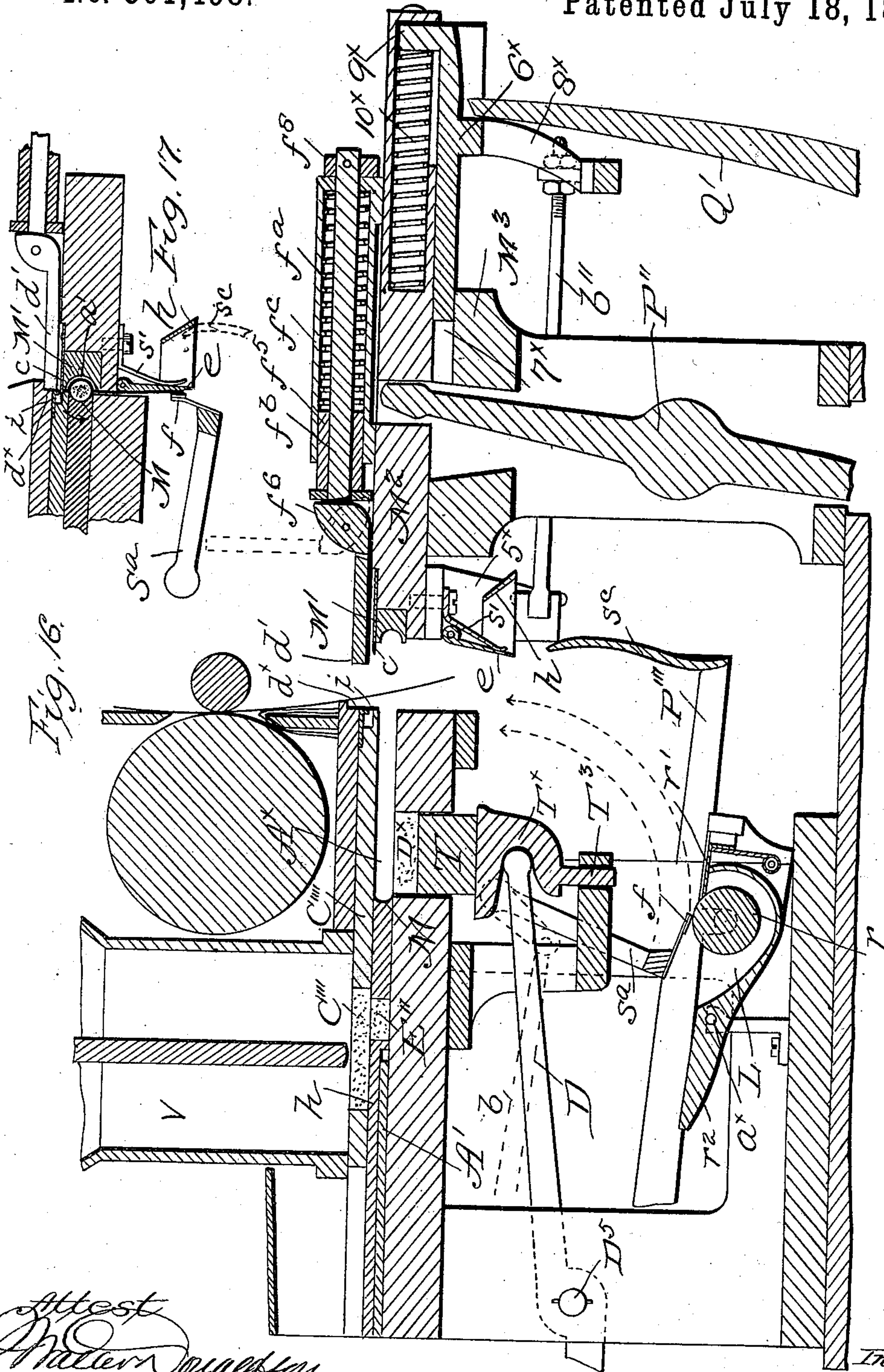
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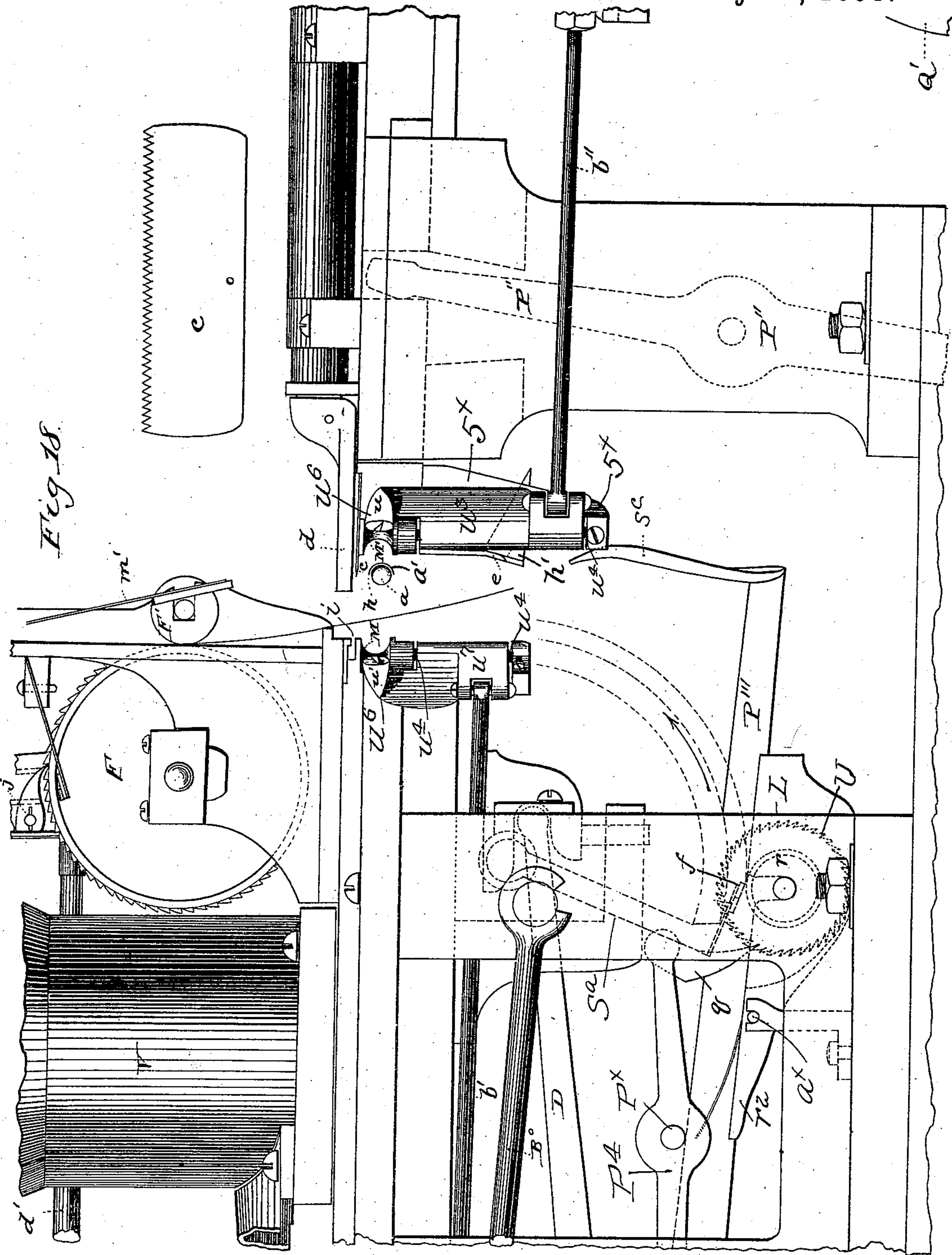
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V. S. FOMBUENA.  
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(No Model.)

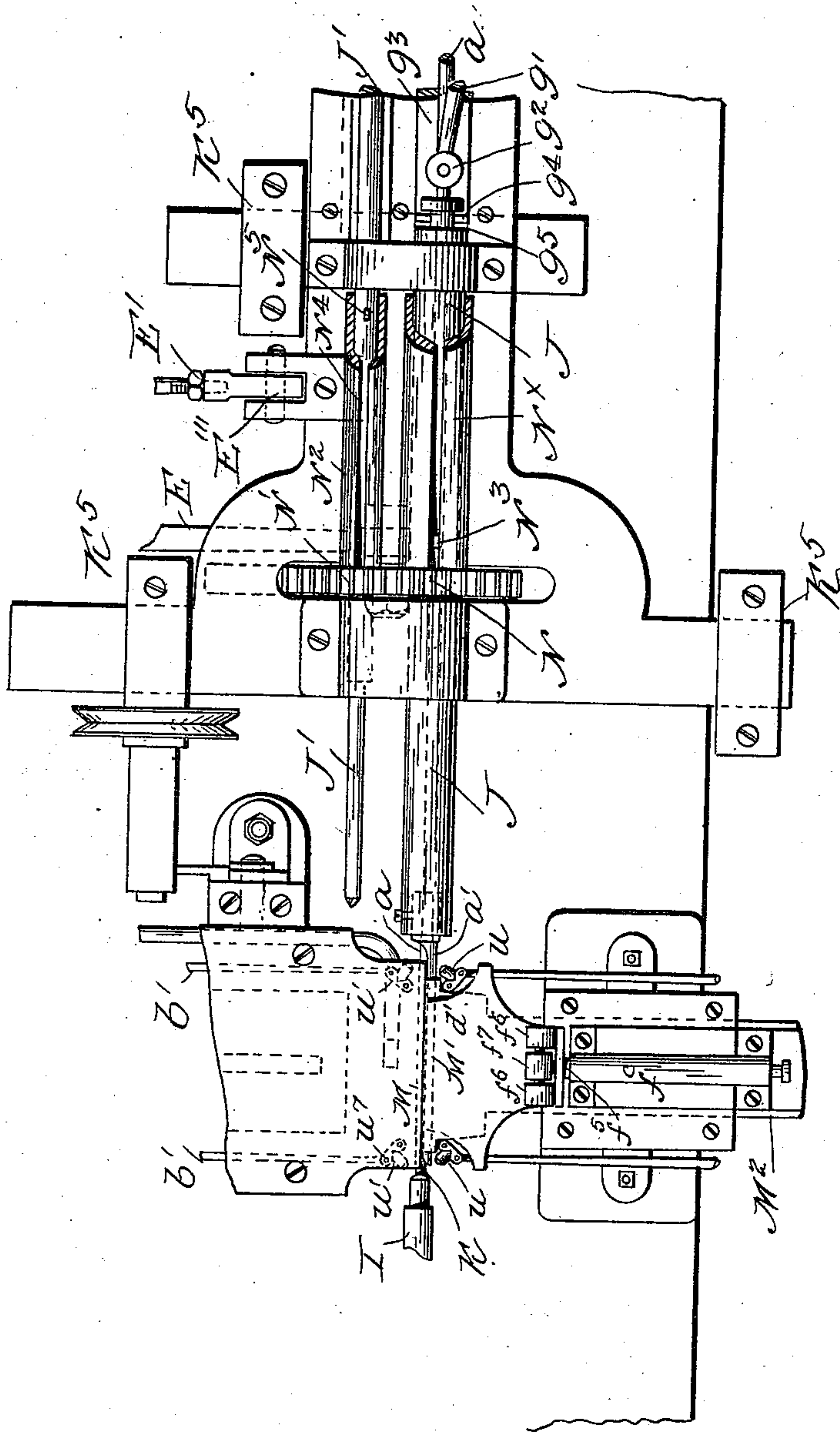
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Fig. 19.



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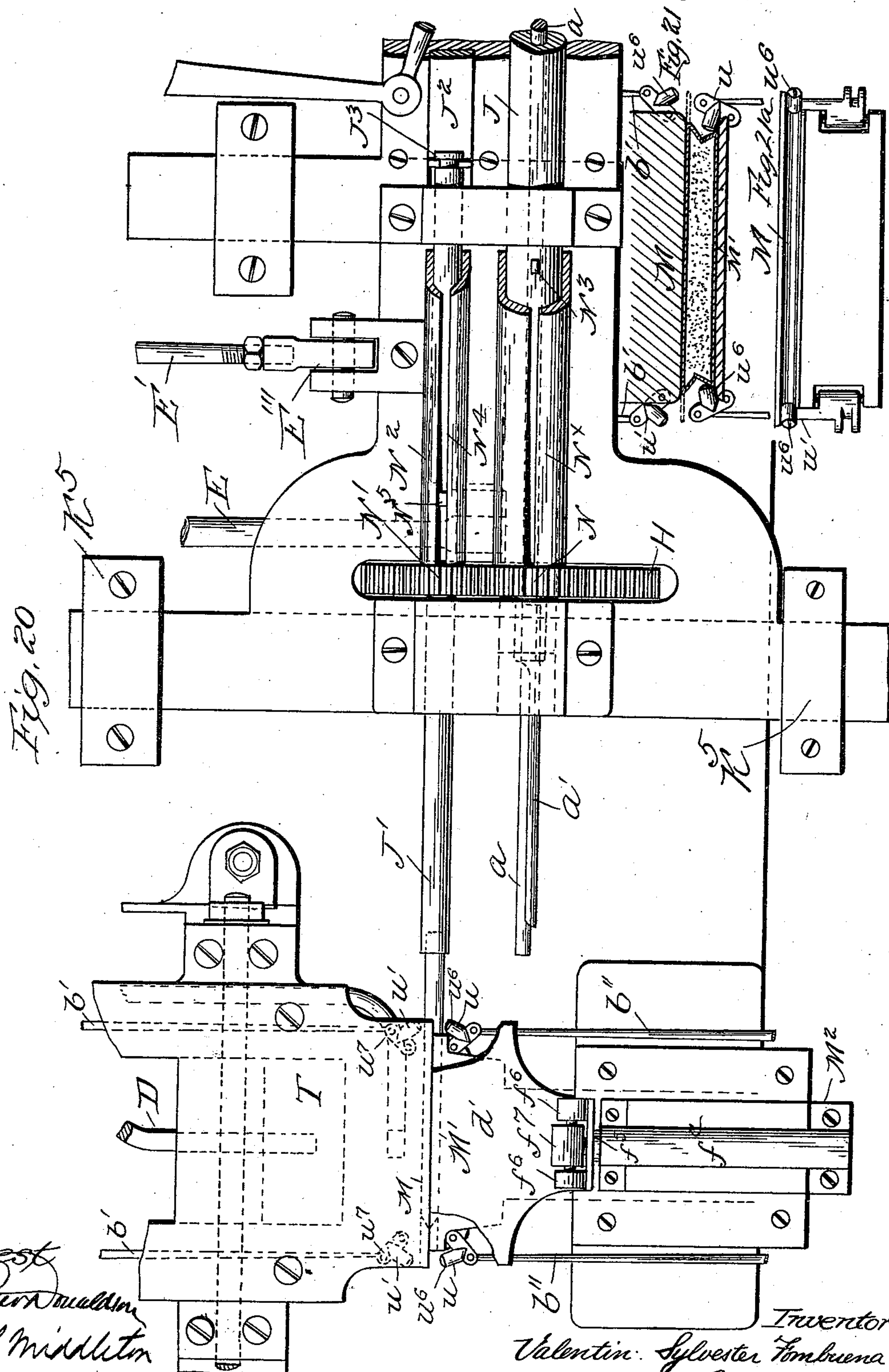
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No. 501,498.

Patented July 18, 1893.



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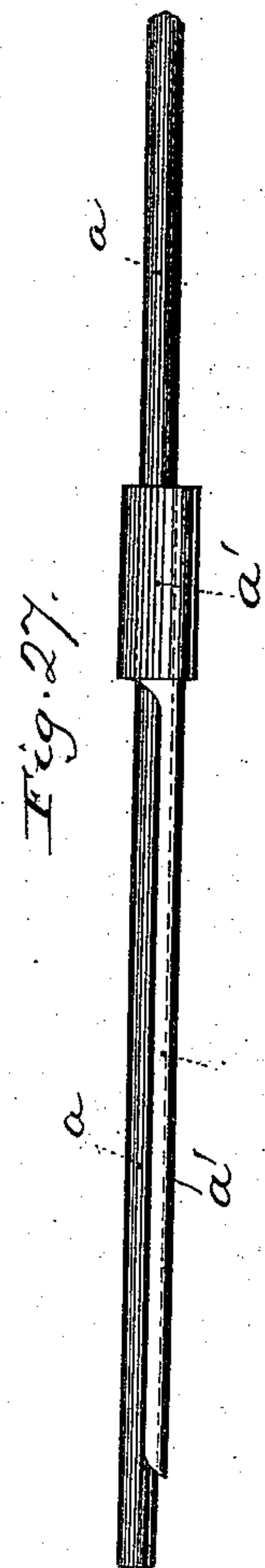
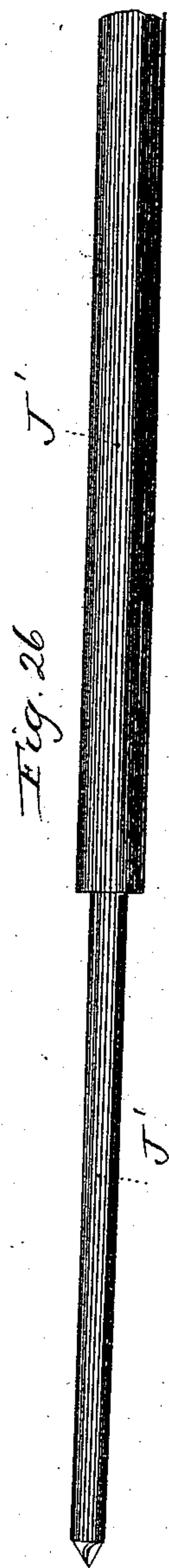
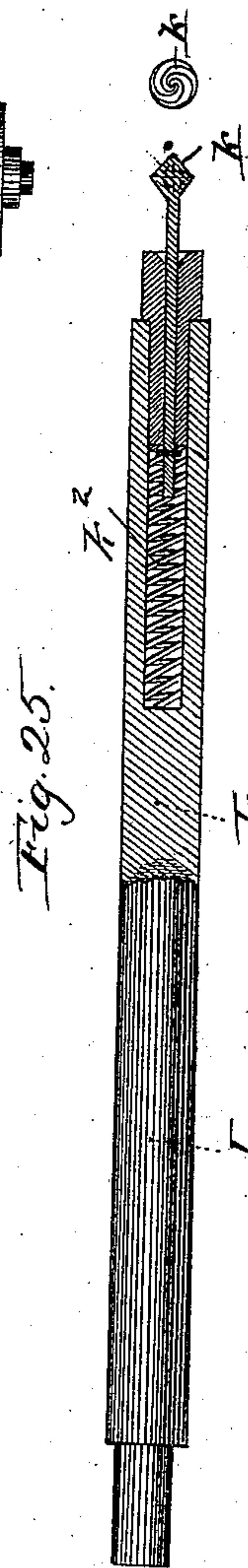
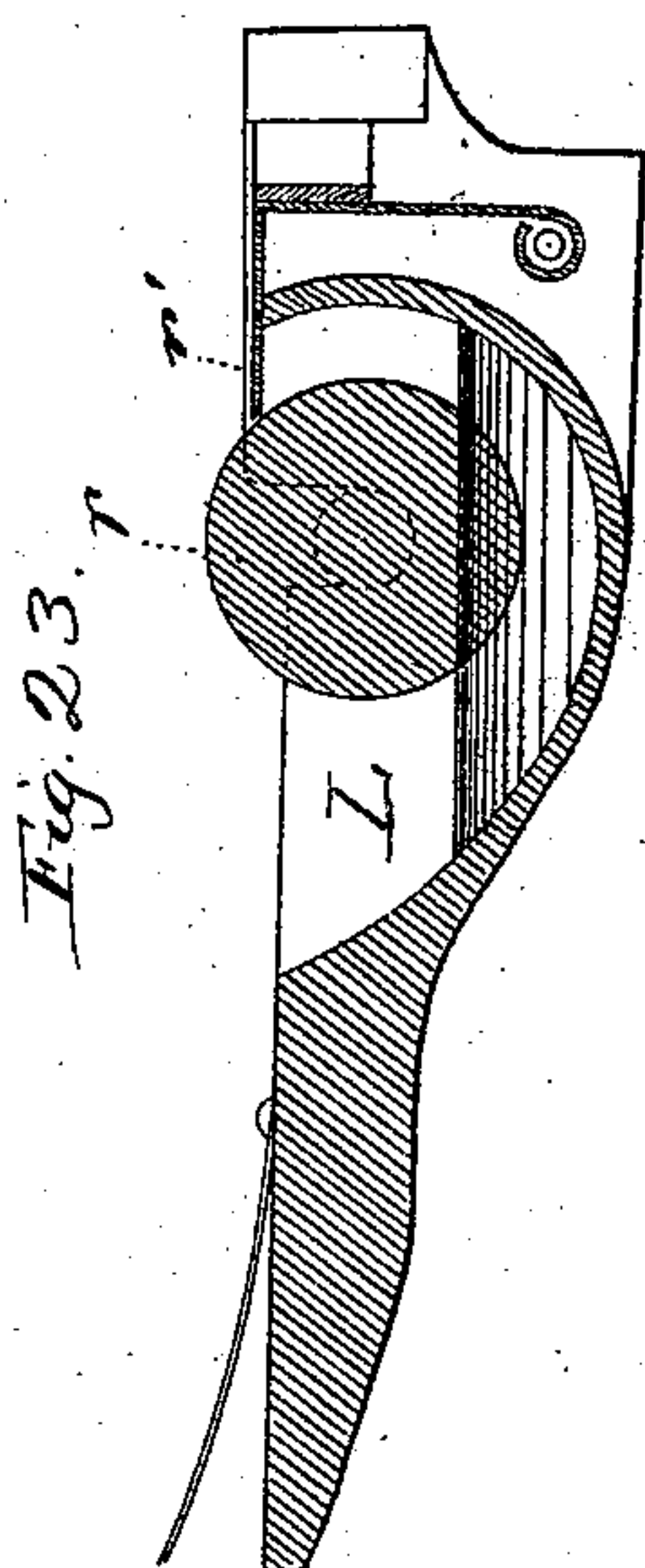
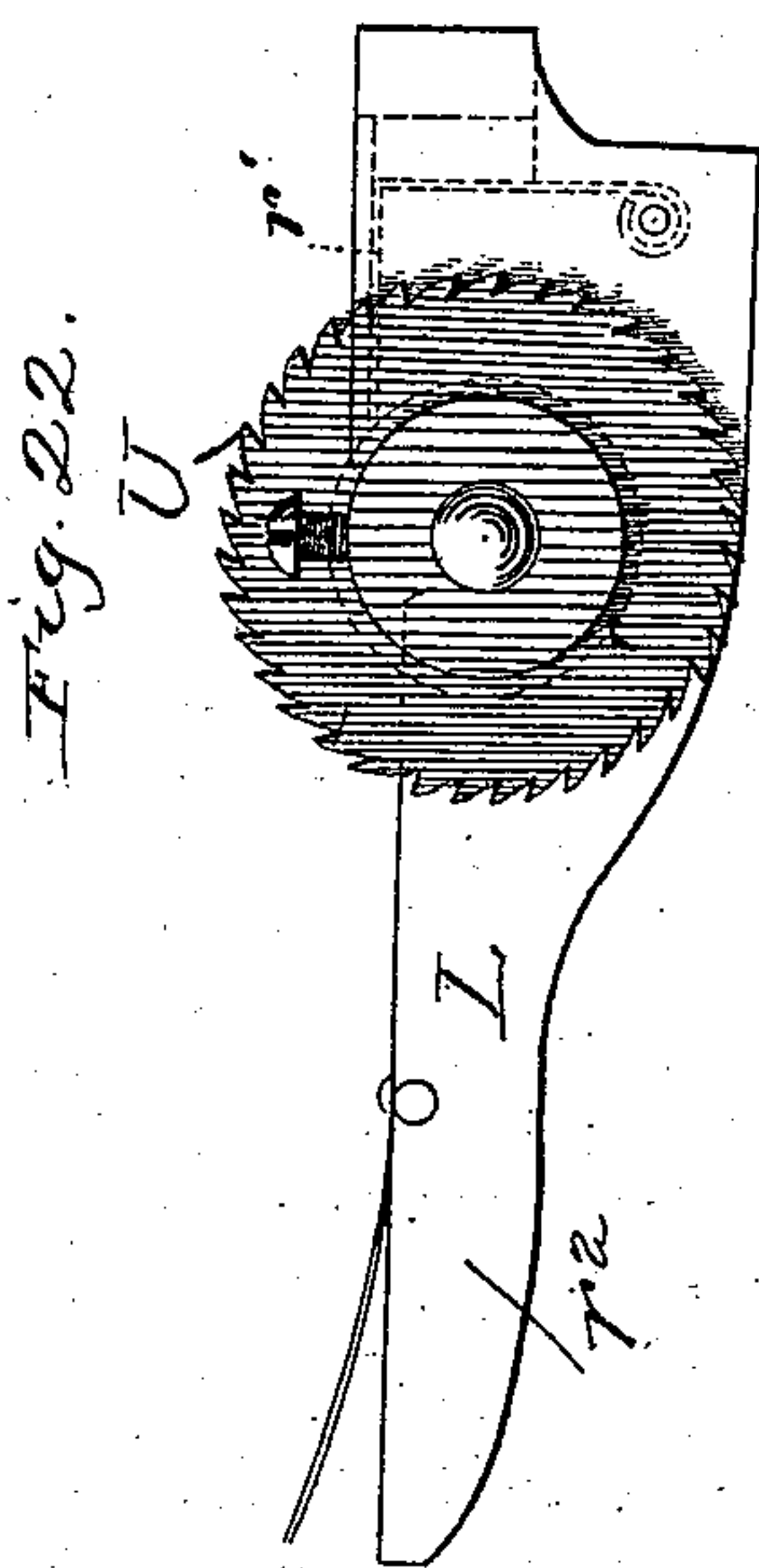
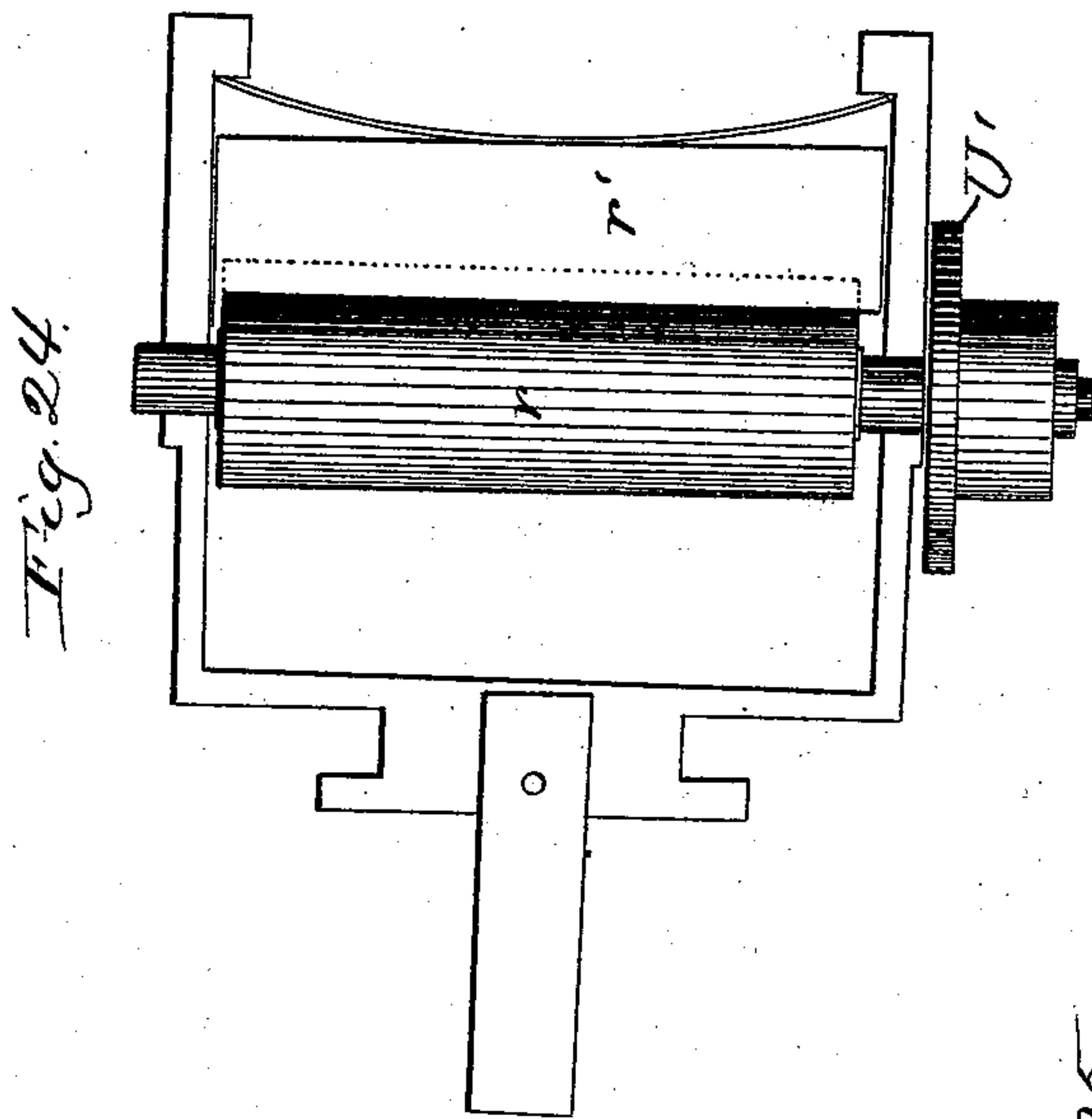
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Witnesses:—  
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# UNITED STATES PATENT OFFICE.

VALENTIN S. FOMBUENA, OF MADRID, SPAIN.

## CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 501,498, dated July 18, 1893.

Application filed June 14, 1890. Serial No. 355,520. (No model.) Patented in Spain April 10, 1889, No. 9,469; in Portugal July 9, 1889, No. 1,384; in France July 10, 1889, No. 199,903; in Belgium July 18, 1889, No. 87,028; in Switzerland February 6, 1890, No. 2,089; in Germany February 25, 1890, No. 54,072, and in England April 29, 1890, No. 6,588.

*To all whom it may concern:*

Be it known that I, VALENTIN SILVESTRE FOMBUENA, a citizen of Spain, residing at Madrid, have invented certain new and useful  
5 Improvements in Cigarette-Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

The invention has been patented in England April 29, 1890, No. 6,588; in Spain No. 9,469, dated April 10, 1889; in France No. 199,903, dated July 10, 1889; in Belgium No. 87,028 dated July 18, 1889; in Germany February 25, 1890, No. 54,072; in Switzerland No. 2,089, dated February 6, 1890, and in Portugal  
15 No. 1,384, dated July 9, 1889.

The object of my invention is to make cigarettes closed at both ends, and with or without the use of gum, of tobacco hacked or cut in squares.

20 Figure 1, is a plan view of the entire machine; Fig. 2, a side elevation of the same. Fig. 3, is a side view of part of the machine looking from the right of Fig. 1. Fig. 4, is a front elevation of part of the machine with  
25 portions in section. Fig. 5, is a sectional view through the tobacco feed slide and the mold section carried thereby. Fig. 6, shows in detail and detached the opposing tuckers for the ends of the wrappers. Figs. 7 to 15 are views  
30 of the various cams for imparting motion to the various mechanisms. Fig. 16, is a vertical sectional view through the mold sections and the parts of the machine adjacent thereto. Fig. 17, is a detail view showing the mold sections as closed together and the wrapper about  
35 to be rolled around the filler. Fig. 18, is a side elevation of that portion of the machine which is shown in Fig. 17. Fig. 19, is a plan view of the mold sections closed with the  
40 gouge between them. Fig. 20, is a view similar to Fig. 19 with the parts in a different position. Fig. 21, is an exaggerated detail view showing the manner of tucking in the ends of the wrapper. Fig. 21<sup>a</sup> is a front view of  
45 the rear tuckers. Figs. 22, 23 and 24 show respectively a side view section and plan of the glue tank and roller. Fig. 25 is a detail sectional view of the left hand spindle with its needle. Fig. 26, is a side view of the right

hand spindle, and Fig. 27, shows the hollow 50 gouge with its spindle.

The tobacco is placed in a hopper V where it is agitated by arms  $v^x$  on a vertical shaft which is driven from the main shaft A by a belt 100 and suitable gearing as at 101, Fig. 1. The tobacco falls from the hopper through an opening C''' in the top plate C'''' of the stationary frame work and into a second opening E'' in the sliding plate A', Figs. 2, 5 and 16  
55 which moves in a way  $A^x$  below the top plate C'''''. This plate as shown in Figs. 1 and 2 is reciprocated from the main shaft A through a cam 4 thereon having a groove 4<sup>a</sup>, Fig. 10, which receives a roller on the end of the pitman W which is pivoted to the rear head of  
60 the plate A', Figs. 2 and 5. The rear end of the pitman is supported by a lever R'' Figs. 1 and 2, pivoted to the bed of the machine. The forward end of the slide is grooved in the form of a semi circle, said groove extending from edge to edge of the slide which  
70 is of sufficient width to form the cigarette from end to end. The opening E'' which receives the charge of tobacco sufficient for each cigarette is made adjustable in size by an adjustable plate h carried by the slide and having a rear upturned lip through which passes an adjusting screw  $t'$  extending also through  
75 a lip  $t^x$  on the rear head of the main slide. The grooved end M of the slide forms one half of the mold which presses the filler into shape to receive the wrapper. Each time the  
80 mold slide moves forward the charge of tobacco in the opening E'' falls into the opening D<sup>x</sup>, Figs. 5 and 16, which is located below the slide way  $A^x$  and forward of the hopper and of the rearward limit of the mold  
85 slide and on the next forward movement of the mold slide this charge in the opening D<sup>x</sup> is lifted into the slide way directly in front of the advancing mold section M, Fig. 21, and the charge is then forced forward along the  
90 slide way until it meets the rearwardly moving mold section M' hereinafter described, when it is compressed into proper form between them. The lifting of the tobacco from the opening D<sup>x</sup> is done by the piston T which has a socket portion T<sup>x</sup> engaged by a lifting



lever D and a guide stem T<sup>3</sup> passing through a stationary part of the frame. The lever D is pivoted to the frame work at D<sup>5</sup> and it is operated by a roller on its rear end engaging a cam groove 5<sup>a</sup> in a cam wheel 5, Figs. 1 and 11.

The forward mold section M' consists of a piece of a width equal to the length of the cigarette to be formed having a semi-circular groove in its face like the mold section M and carried by a slide M<sup>2</sup> moving in suitable ways in the front standard M<sup>3</sup>, Figs. 2, and 3. This slide is reciprocated by a lever P'' pivoted to the front standard and having its lower end connected with a rear lever P<sup>v</sup> pivoted to the bed and having a roller at its upper end engaging a cam groove 3<sup>a</sup> in the cam wheel 3 on the main shaft A. Before these mold sections M, M' come together as shown in Fig. 17, to compress the filler it will be understood that the paper had been fed down between them as shown in Figs. 16 and 18 from the feeding rolls F, F', and further than this, a gouge a' consisting of a rod semi-circular in cross section, Figs. 17, 18, 19, 20 and 27 has been advanced horizontally between the mold sections with its concaved side to the rear and lying on the front side of the depending paper strip. The mold sections continuing to move together finally assume the relative positions shown in Fig. 17, and press the filler into the hollow or concaved side of the gouge together with the paper strip, the paper being between the gouge and the filler. The strip is severed close above the filler by a knife c carried by the slide of the mold section M' and projecting rearwardly to enter the notch i in the top plate C'''' the edge of which notch acts as a shearing edge co-operating with the knife c.

For the cutting operation the paper is held firmly close above the knife c by the plate d', the rear edge of which presses the paper against the surface d<sup>x</sup> and prevents the knife from drawing the web downward between the feed rolls. This plate is carried by a stem f<sup>b</sup> movable in a box f<sup>c</sup> on top of the forward mold slide and said stem is pressed normally forward by a spring f<sup>a</sup> bearing against the rear end of the box and a collar f<sup>5</sup> on the stem which collar bears on the cam shaped ears f<sup>6</sup> of the plate d' pivoted to the head f<sup>7</sup> of the stem. The stem is limited as to its rearward movement by the nut f<sup>8</sup> on its front end. By this construction the plate d' can yield when the mold sections come together and the plate can be turned up on its pivot as shown in dotted lines Fig. 16, to expose the mold section beneath and also the knife c. The cam shape of the ears and the action of the spring will hold the plate d' in either position. The paper having been severed, the gouge is revolved in the direction of the arrow, Fig. 17, to wrap the paper, and this movement is imparted through the gear wheel N and sleeve N<sup>x</sup> carrying the same through which the spindle J of the gouge passes as in

Fig. 1, there being a splined connection at N<sup>3</sup> between the spindle and the slotted sleeve which permits the longitudinal reciprocation of the gouge to and from its position between the mold sections. The gear wheel N is operated from the toothed segment H, Fig. 3, pivoted to the bed of the machine and operated through the rod E from the cam wheel 6, Figs. 1 and 12, having a cam groove 6<sup>a</sup> in its side to receive a roller from the rear end of the rod E, a lever E<sup>x</sup> pivoted to the bed, Fig. 1, being used to sustain the rear end of the lever.

The longitudinal reciprocation of the gouge to and from its position between the mold sections shown respectively in Figs. 20 and 19, is given through the lever G', Fig. 1, operated by peripheral cam groove in a cam 8 on the shaft A, the forward end of the lever being connected by a link g' with the post g<sup>2</sup>, which is secured to a slide g<sup>3</sup> moving in a guide way in the plate K, and having at one end a bifurcated up-turned lip g<sup>4</sup> embracing the grooved end g<sup>5</sup> of the gouge spindle J as shown in Figs. 1, 4 and 19. By this construction it will be seen that the spindle J can move freely lengthwise through the sleeve N<sup>x</sup> while by reason of the splined construction the gouge spindle can be rotated and the swiveled connection allows this rotary movement.

*Pasting mechanism.*—Before the wrapper is rolled about the cigarette it is pasted and this is done by the flexible gummer plate f carried by a rocking lever S<sup>a</sup> pivoted in the standard which supports the slide ways of the mold slide A'. This lever is operated through the rod b and crank m, the rear end of which is supported by a lever f<sup>x</sup> pivoted to the bed and carrying a roller to be pressed upon by the cam C on cam wheel 2, as in Figs. 1 and 2. The gummer plate receives the glue or gum by contacting with the glue roller r, Figs. 2, 16-18, 22-23 and 24. This roller is journaled in the sides of the reservoir L which is pivoted at a<sup>x</sup> and has a tail piece r<sup>2</sup> adapted to be struck by a pin P<sup>x</sup> on the lever P<sup>4</sup> pivoted to the frame at l<sup>x</sup> and operated by the cam 4, on the shaft A. When the tail piece is depressed the reservoir is tilted up and the roller with the glue thereon contacts with the gummer plate f. During this movement the roller is turned slightly by the pawl q on the end of the lever P<sup>4</sup>, engaging the ratchet wheel U. A suitable scraper r' is arranged on the reservoir to take off the surplus glue. The upward movement of the lever S<sup>a</sup> carries the gummer plate into contact with the lower rear edge of the unsevered paper strip as shown in Fig. 17, the said strip bearing on its front side against the lower part of the apron e pivoted to the rear edge of the slide M<sup>2</sup> and depending therefrom, its lower edge being pressed rearwardly by the spring s', secured to the under side of the slide M<sup>2</sup>. This spring apron is carried back and forth by the slide M<sup>2</sup> in the opening and closing of



the mold sections and has independent yielding movement on its pivot. This apron therefore provides a yielding back plate against which the lower end of the wrapper strip is pressed by the gummer plate. In order to release the lower end of the paper from the apron the said apron is turned on its pivot away from the paper and the position shown in Fig. 17, after the glue has been applied by the finger (s c) on the lever P''' which is pivoted to the frame at 1<sup>x</sup> and is operated by a roller on the cam disk 4, engaging the rear end of the lever, as shown in Figs. 2 and 21. The finger s c engages the incline plate h of the apron when the lever P''' rises and pushes the apron forwardly away from the paper. The position of the finger when about to contact with the inclined plate h and push the apron forward is indicated in dotted lines in Fig. 17.

*Compressing mechanism.*—The strip having been pasted and rolled the next action is to press the tobacco lengthwise of the wrapper from the ends inward so as to leave the ends of the wrapper free for folding in in order to close the ends. On the left of the cigarette this compression is done by the spring head k of the needle I which needle is advanced directly in line with the cigarette through the bearing I<sup>5</sup> of the standard I<sup>6</sup> by means of the lever P connected to the end of the needle by the link P<sup>9</sup> and operated from a peripheral cam groove of the cam l. This needle with its head having advanced into the open end of the cigarette holds the tobacco while being compressed by a stem a which is advanced along the concaved side of the gouge a' as the same is withdrawn from the rolled cigarette. This stem passes through the spindle J of the gouge and also through an opening in the post g<sup>2</sup> and a bearing o' on the plate K, its extreme end being connected to a lever S' Fig. 1, operated from the cam 8 on the shaft A through a lever G'' pivoted at g'' and connected with the lever S' by the link S.

*Tucking mechanism.*—After the compression the needle I and stem a are retracted and the next operation is the tucking in of the ends of the wrapper. This is done by the rear tuckers u', u' and the front tuckers u, u. These tuckers comprise as shown in Figs. 6 and 18, a body portion u<sup>3</sup> having journal bearings u<sup>4</sup> and a tucking finger u<sup>6</sup> having a rib on its front end. The tuckers u', u', are journaled in the stationary frame below and adjacent to the slide way of the mold section M so that their upper fingers may be swung from their normal position which is slightly at an incline to the mold face, Fig. 21, a quarter turn around the end of the said mold section (when moved forward) so as to extend into the groove thereof. The rib on the end of the finger thus engages the rear edge of the wrapper and tucks the same in at an angle after which these tuckers return to normal position and the front folders u, u, effect the same result with the opposite projecting

edge of the wrapper. The rear tuckers are operated by the rods b' connected with the ears u<sup>7</sup> thereof and the cross head X', Fig. 1, which latter is on a slide X moving in the standard X<sup>2</sup> and operated from the cam projection L<sup>x</sup> on the cam 4 which engages a roller on the rear end of the slide X. The front tuckers are journaled in the hangers 5<sup>x</sup> extending down from the rear corners of the front mold slide M<sup>2</sup> and are operated through the rods b'' connected to their ears and to a cross head 6<sup>x</sup> which slides in a way 7<sup>x</sup> of the front standard, Fig. 16, and has arms 8<sup>x</sup> extending down to connect with the rods b'' and a stud 9<sup>x</sup> which extends up through a slot in the under side of the mold section M<sup>2</sup> to engage the front end of a spring 10<sup>x</sup> in a socket of the slide. The cross head 6<sup>x</sup> is forced to the rear to operate the tuckers by the lever Q' operated through the rod B'', Fig. 2, rear lever Q and cam projection C'' on the cam wheel 3. The tuckers u, u, are retracted by the spring 10<sup>x</sup> bearing on the stud 9<sup>x</sup>. After the tucking operation and the return of the tuckers to normal position, the needle I is again advanced to place the spirally grooved spring head k into the tucked end of the wrapper; simultaneously with this movement, the sliding plate K, Fig. 1, which moves in bearings K<sup>5</sup> of the frame is moved forwardly by the rod E' pivoted thereto at E''' and operated by a cam groove 7<sup>a</sup> in the cam 7. This plate carries the gouge a' with its spindle and bearings therefor to the front together with the stem a and also the revolving stem J' journaled in rear of and parallel with the gouge and its spindle. The forward movement of the plate carries the gouge and the stem a out of line with the cigarette and brings the rear stem J' into line therewith, as shown in Fig. 20, and then the stem is pushed lengthwise by the lever G<sup>0</sup> and cam 8 on the shaft A, said lever being connected by a link g<sup>0</sup> with the slide J<sup>2</sup>, Figs. 13 and 20, movable in a way in the plate K, and connected to the end of the stem by the swivel at J<sup>3</sup>, the stem passing through a sleeve N<sup>2</sup> having a gear N' meshing with the gear N before mentioned, the rotation of which turns the spindle J' after it has advanced into contact with the folded end of the cigarette. The sleeve is slotted longitudinally at N<sup>4</sup> and receives a pin N<sup>5</sup> from the stem J' so that the stem can move freely lengthwise and still be revolved by the rotation of the sleeve. The needle I with its spring head is rotated by a pinion V<sup>2</sup> thereon and driven by a segmental gear B, operated by a rod B<sup>2</sup> connected to an arm B<sup>x</sup> of the segment, Fig. 2, said rod being operated from the cam 2 on the main shaft. Both the head k and the end of the stem J' are conical and spirally grooved and when they bear on the ends of the cigarette they first press the tucked ends of the wrapper inwardly into conical form and their revolution then smooths out all wrinkles. The spring k<sup>2</sup> of the head k is shown in Fig. 25.



*Discharging action.*—The cigarette having now been completed, the needle I with its head recedes again and the stem J' advances and pushes the cigarette out of the mold into any suitable receptacle. Then the sections of the mold recede, the paper is fed down, the gouge advances between the mold sections and the operations above described are repeated. The paper is drawn from the roll Y, Fig. 2, over rollers  $r^0$   $r^3$  and between the feed rolls F, F', the former being operated step by step by a pawl j engaging teeth at the end of the roller and carried by an arm x pivoted on the axle of the roller F, Fig. 3, which arm is operated through the rod d from the cam 5, the rod being adjustable in the slot x' of the arm to secure different feeds of paper, as shown in Fig. 3. The roller F', is pressed against the roller F by a spring  $f^0$ .

I claim—

1. In combination, the hopper, the feed slide having an opening to receive the charge of tobacco, the frame having a pocket D<sup>x</sup>, the vertically movable plunger T therein with means for operating the same, the said feed slide carrying the mold section M, the mold section M' with means for operating the same and the mechanism for rolling and tucking in the ends of the wrapper, substantially as described.

2. In combination, the hopper, the feed slide having an opening to receive the charge of tobacco, the mold sections with operating means therefor, the means for feeding the charge of tobacco in front of one of the mold sections the wrapper rolling and tucking mechanism, and the means for regulating the size of the feed slide opening consisting of the adjustable plate h with the adjusting means therefor, substantially as described.

3. In combination, the reciprocating mold sections M, M' with means for operating them, the paper feeding devices for feeding the paper between said mold sections, the hollow gouge a' having longitudinal reciprocating movement and also rotary movement, said gouge being arranged to move to and from position between the mold sections, the cutter and the tucking mechanism with operating means therefor, substantially as described.

4. In combination, the reciprocating mold sections with operating means therefor, the feed rollers arranged above the mold sections for feeding the paper down between them, the knife c carried by one of the mold sections, the spring plate d' also carried by one of the mold sections for holding the web, the hollow gouge with means for reciprocating it to and from position between the mold sections, means for rotating the gouge and tucking mechanism, substantially as described.

5. In combination, the mold sections M, M' with means for moving them to and from each other, the said section M moving in a way A<sup>x</sup> in the frame, the means for feeding the tobacco into said way in front of the mold section M, the paper feeding rolls, the

cutting knife carried by one of the sections to sever the paper, the paper rolling means, the tucking mechanism and means for operating the same, substantially as described.

6. In combination, the reciprocating mold sections, the means for feeding the tobacco between them, the paper feeding rolls arranged to feed the paper down between the mold sections the revoluble gouge, the pasting roller, the oscillating lever S<sup>a</sup> carrying the gummer to contact with the lower end of the paper, the means for operating the said lever, the means for operating the gouge, and tucking mechanism with operating means therefor, substantially as described.

7. In combination, the reciprocating mold sections, the feed rolls for feeding the paper down between them, the revoluble gouge, the oscillating lever carrying the gummer, the paste roller having the ratchet, the pivoted tank carrying the roller, the lever carrying the pawl for operating the ratchet and arranged to tilt the tank to move the roller into contact with the gummer, and the tucking mechanism with means for operating it, substantially as described.

8. In combination, the reciprocating mold sections with operating means therefor, the means for feeding the paper down between them, the revoluble gouge with operating means therefor, the yielding apron e carried by one of the mold section slides, and the gummer lever with means for operating the same, substantially as described.

9. In combination, the reciprocating mold sections, the means for feeding the tobacco between them, the means for feeding the paper between them, the hollow gouge a', the means for reciprocating and rotating the same, the stem a movable along the hollow gouge, the reciprocating needle I carrying a head k, the means for reciprocating said needle, and tucking mechanism, substantially as described.

10. In combination, the reciprocating mold sections, the means for feeding the tobacco between them, the means for feeding the paper between them, the hollow gouge a', the means for reciprocating and rotating the same, the stem a with means for reciprocating it, the spindle J' with means for reciprocating it, the reciprocating plate K carrying the gouge with its stem and the spindle J', the means for reciprocating said plate and the tucking mechanism, substantially as described.

11. In combination, the mold sections with means for opening and closing them, the paper feeding mechanism, the needle I operating at one side of the mold sections, the means for reciprocating said needle, the gouge for rolling the paper about the filler, the spindle J', the means for operating the gouge and spindle, and the reciprocating plate K carrying said gouge and spindle and arranged to bring them alternately into alignment with the mold and the needle I, substantially as described.

12. In combination, the reciprocating mold



sections, the paper feeding devices, the means for rolling the cigarette within the mold, the oscillating tuckers at the ends of the mold sections arranged to tuck in the ends of the wrapper and the means for operating the same, substantially as described.

13. In combination, the reciprocating mold sections, M, M' the paper feeding devices, the means for rolling the cigarette within the mold sections, the pair of tuckers  $u, u$ , for the front mold section the tuckers  $u', u'$  for the rear mold sections and the means for operating the same in succession whereby the ends of the wrapper are tucked in from opposite sides, substantially as described.

14. In combination, the reciprocating mold sections, the paper feeding devices, the gouge with means for reciprocating and rotating the same, the stem  $a$  with means for reciprocating it, the reciprocating needle I having the head K, the means for reciprocating the said needle, the spindle J' with operating means therefor and the pivoted tuckers  $u, u'$  at the ends of the molds with means for operating the same, substantially as described.

15. In combination, the mold sections with means for reciprocating the same, the paper feeding devices, the rotary gouge  $a'$  the lever connections for reciprocating the same, the sleeve through which the gouge spindle passes, the gear on said sleeve, the segment for operating the gear, substantially as described.

16. In combination, the stationary frame having the slideway  $A^x$ , the mold section movable in said way, the movable mold section M', the slide  $M^2$  therefor, the means for operating said slide, the means for feeding the paper and tobacco between the mold sections, the rolling mechanism, the two pairs of

tuckers one pair being supported by the stationary frame and the other pair by the movable slide  $M^2$  and means for operating the tuckers, substantially as described.

17. In combination, the mold, the tobacco feeding device, the paper feeding means, the hollow rotary gouge within the mold for receiving the tobacco in its hollow side and rolling the paper and the folding mechanism, substantially as described.

18. In combination, the mold, the tobacco feeding device, the paper feeding means, the rotary means within the mold for rolling the cigarette, the longitudinally reciprocating spindles for compressing the tobacco longitudinal of the cigarette, and tucking mechanism for the wrapper, substantially as described.

19. In combination, the main driving shaft, the mold the paper feeding and cutting device, the gouge  $a'$  in the mold the spindle therefor, the lever connections for reciprocating said spindle, the sleeve through which the spindle passes, the gear N' thereon, the segment for operating the said gear, the spindle J' with lever connections for reciprocating it, the sleeve through which the spindle passes, the gear on said sleeve meshing with the gear N', the plate K carrying the said gouge and spindles and the means for reciprocating the said plate, substantially as described.

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

VALENTIN S. FOMBUENA.

Witnesses:

PLACIDO BALLESTERO,  
ANTO. RODR. CARDOSO.