

No. 814,738.

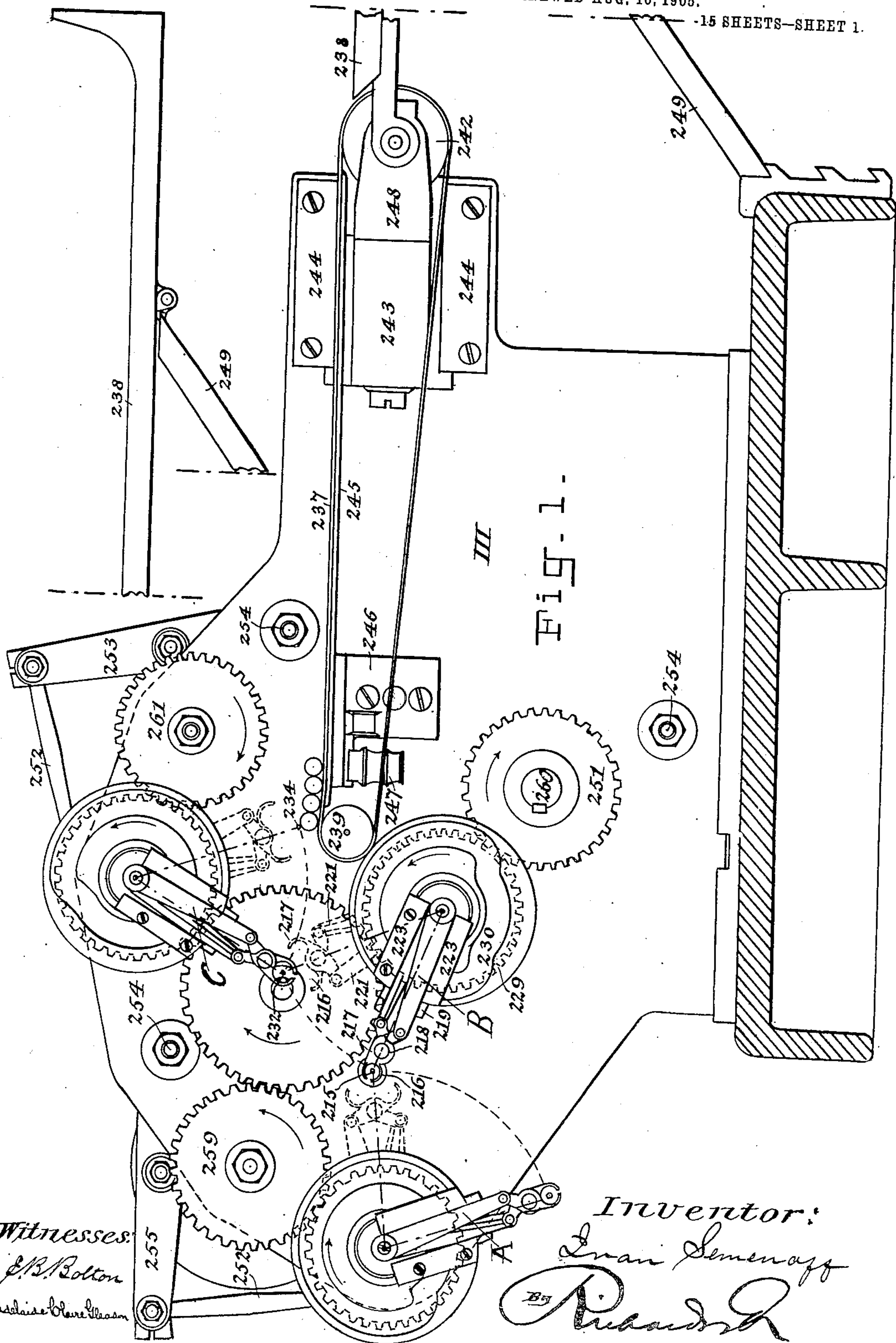
I. SEMENOFF.

PATENTED MAR. 13, 1906.

1. SEMENOFF.
MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.
APPLICATION FILED OCT 22 1906

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

-15 SHEETS--SHEET 1.



Inventor:

Ivan Semenzoff

By Richard

His Attorney.

Witnesses:

E. B. Bolton

Oselaide Claire Gleason

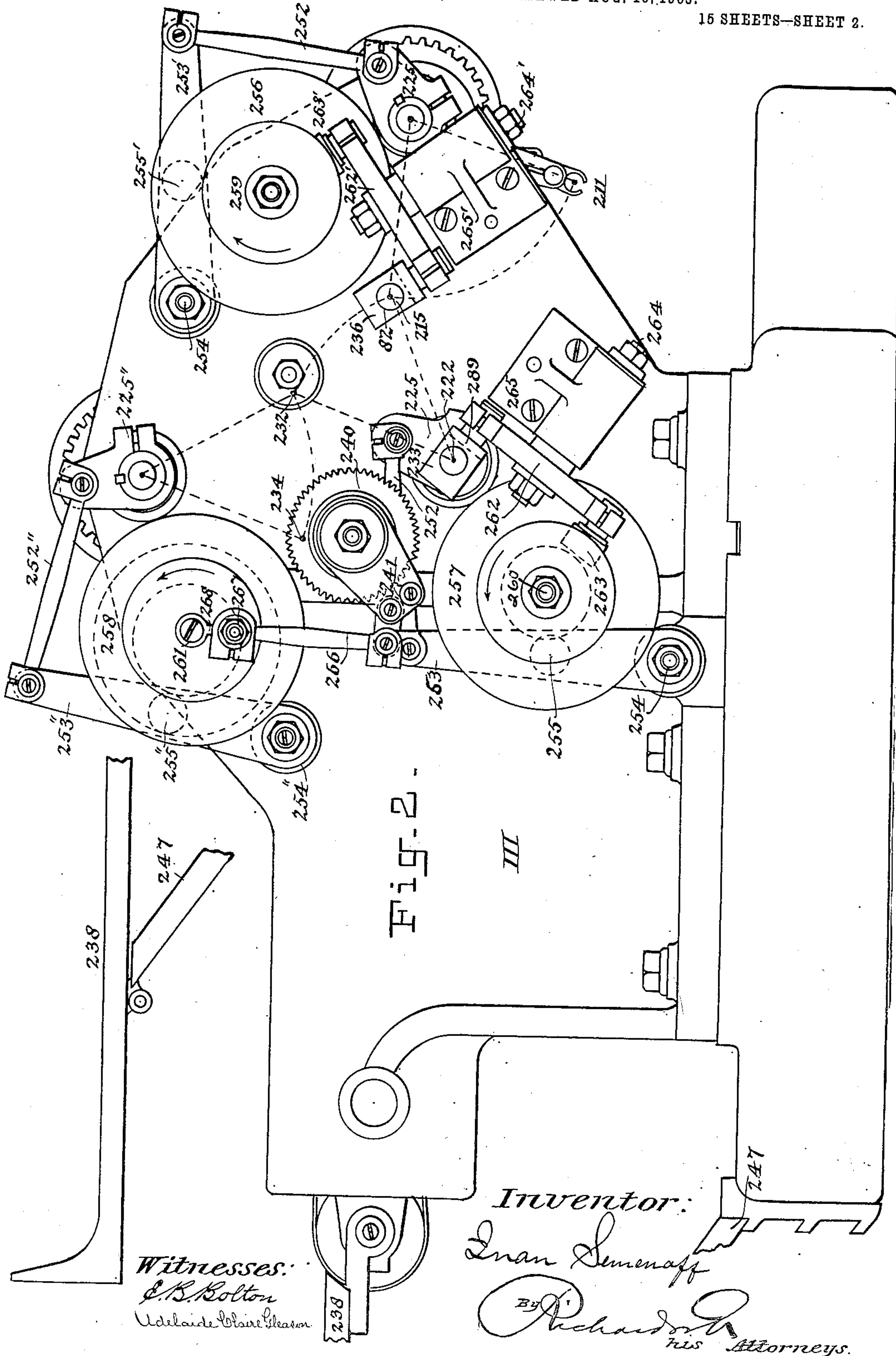
No. 814,738.

PATENTED MAR. 13, 1906.

I. SEMENOFF.
MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 2.



No. 814,738.

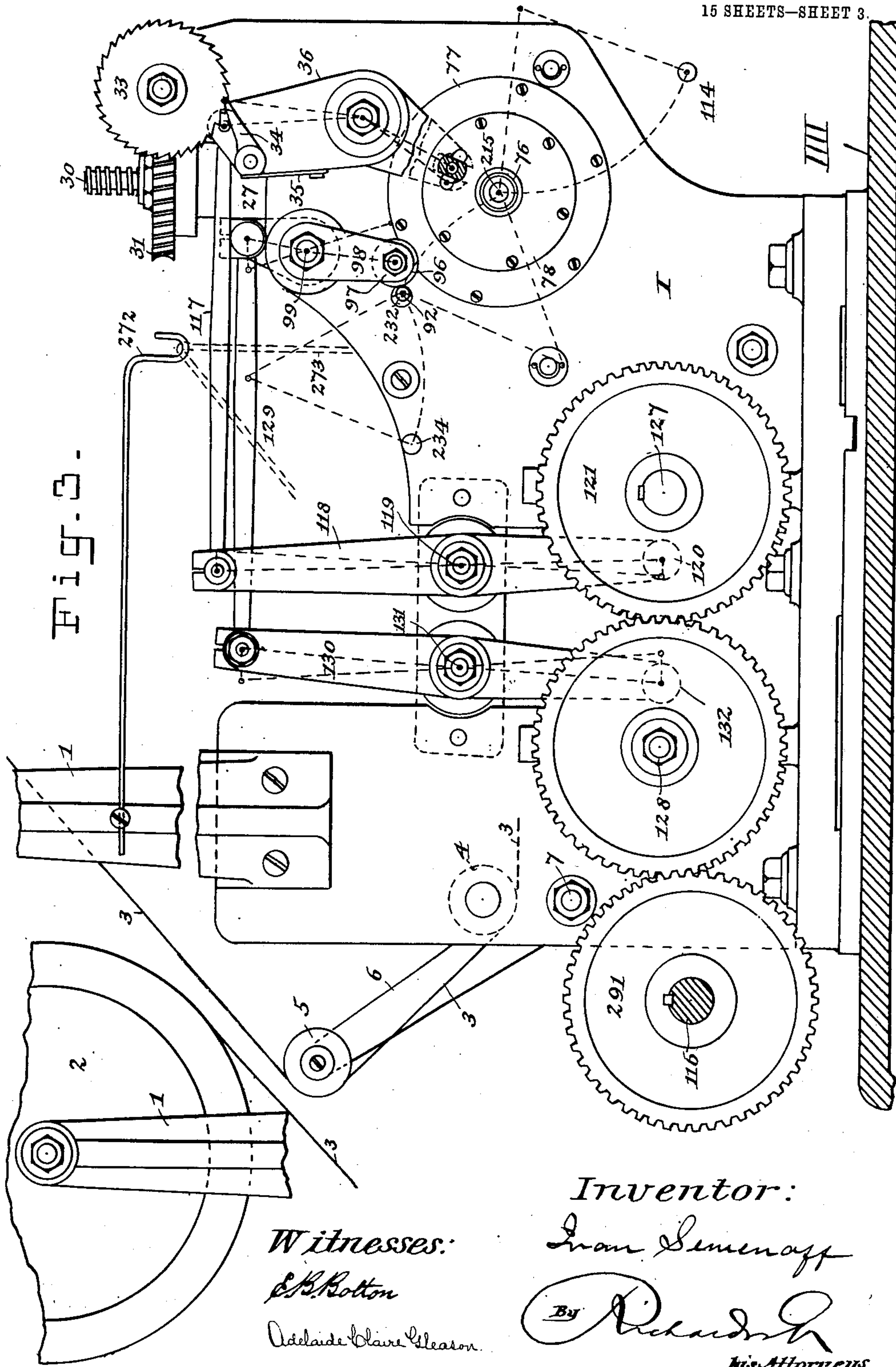
PATENTED MAR. 13, 1906.

I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 3.



No. 814,738.

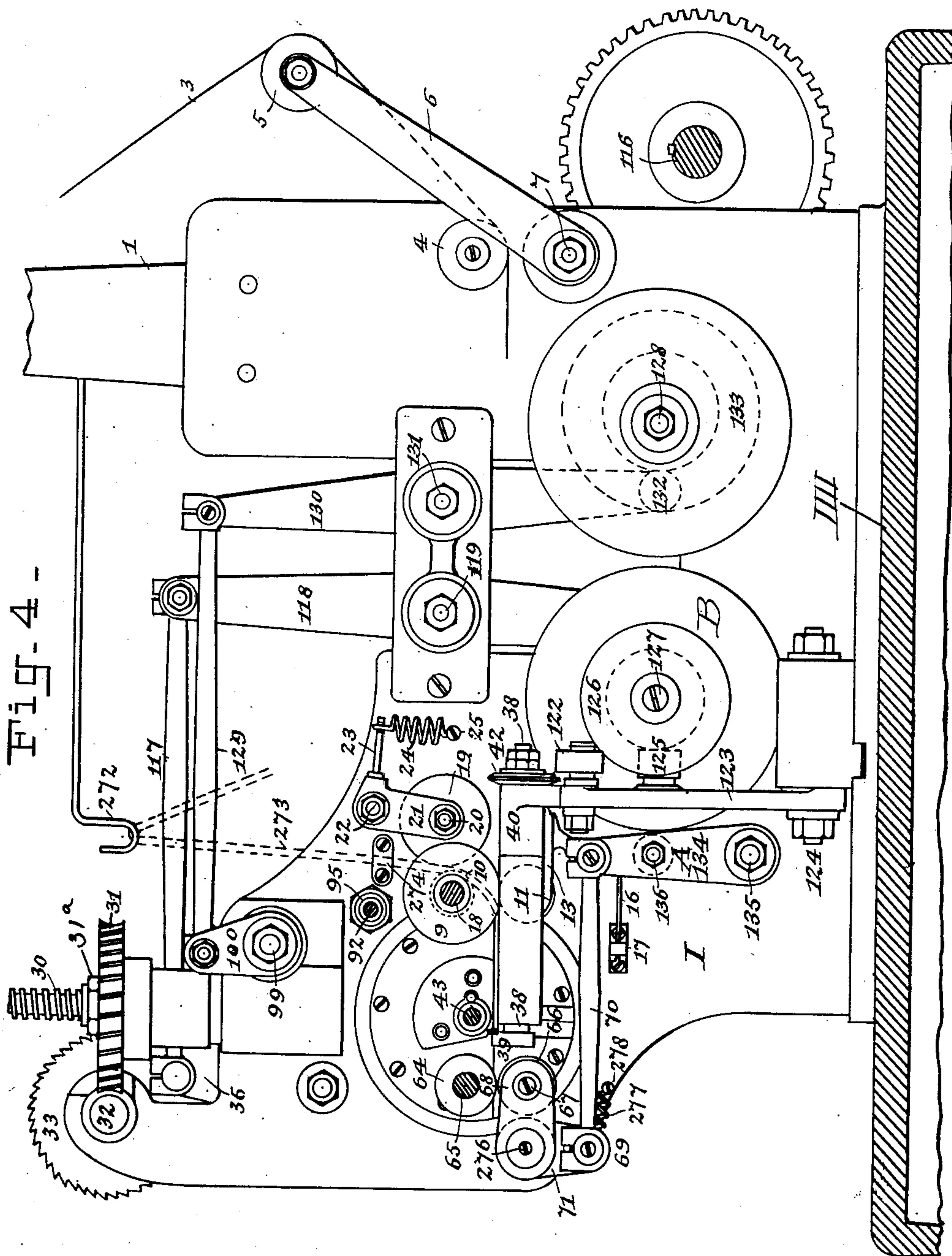
I. SEMENOFF.

PATENTED MAR. 13, 1906.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 4.



Witnesses:

C. B. Bolton

Adelaide Claire Gleason.

Inventor:

Ivan Semenov

By Richard R.

his Attorney.

No. 814,738.

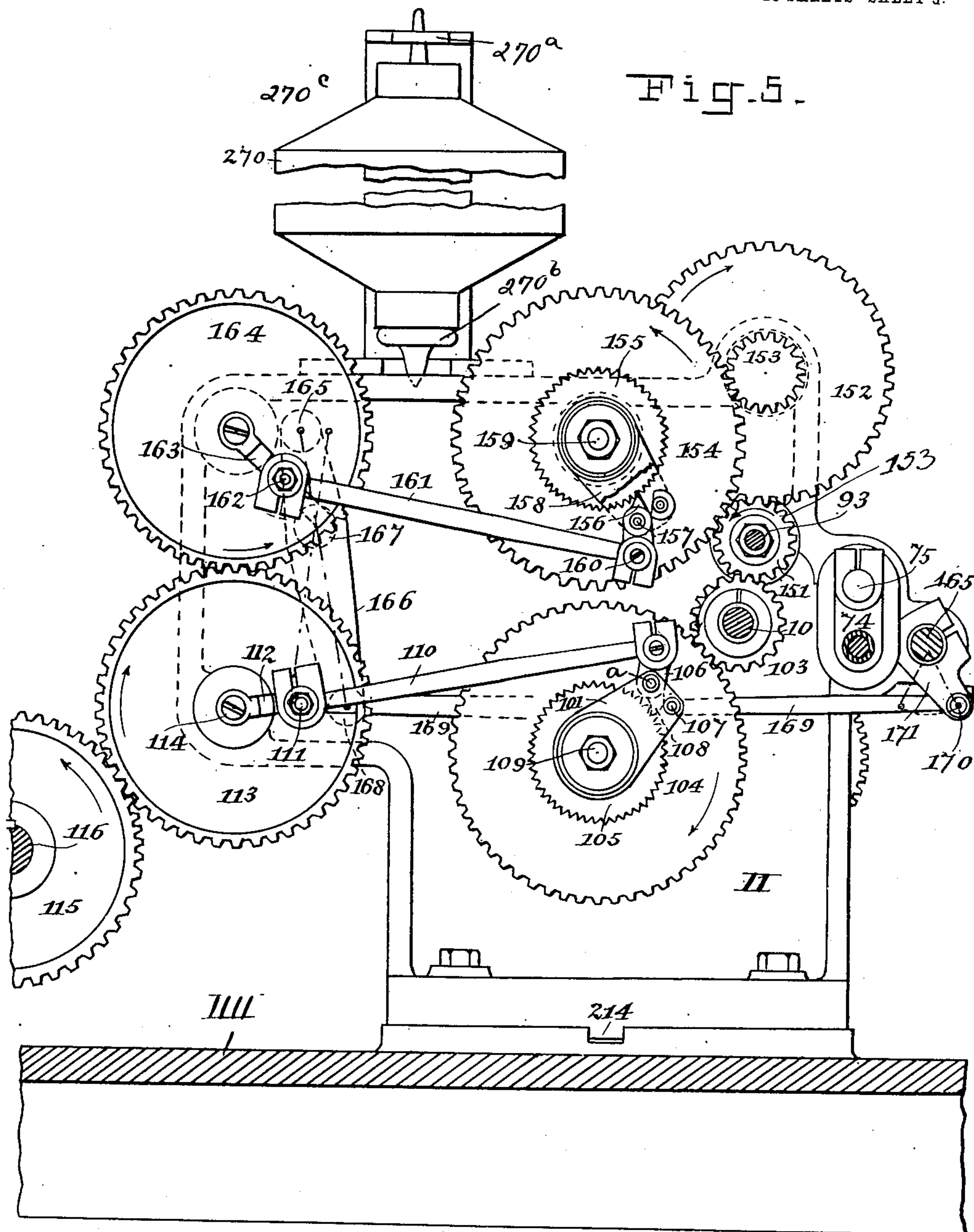
PATENTED MAR. 13, 1906.

I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 5.



Witnesses:

C. B. Bolton

Adelaide Claire Gleason.

Inventor:

Ivan Semenoff

By *Richard*
his Attorneys

No. 814,738.

I. SEMENOFF.

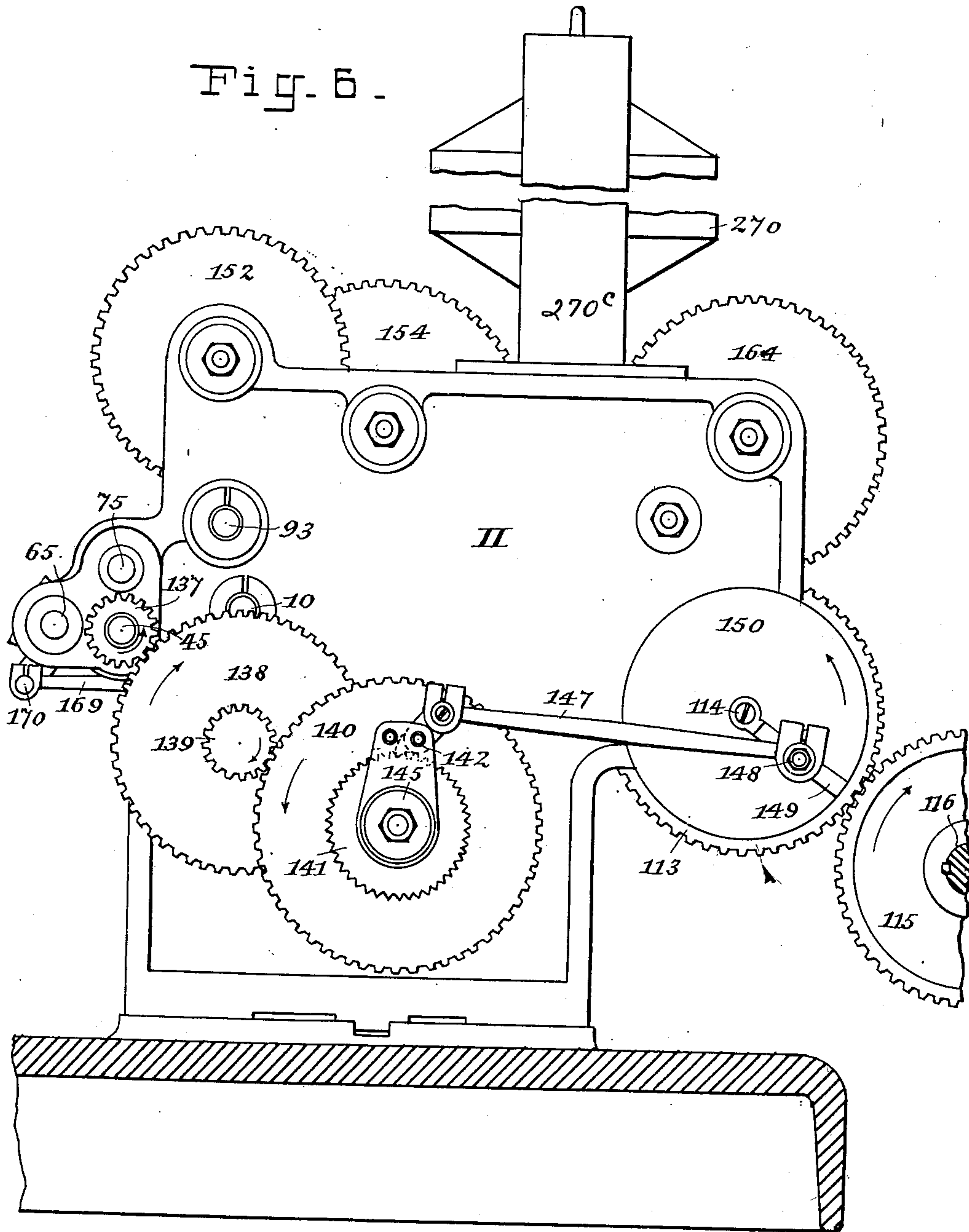
PATENTED MAR. 13, 1906.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 6.

Fig. 6.



Witnesses:

E. B. Bolton

Adelaide Claire Gleason.

Inventor:

Ivan Semenov

By Richard S. [Signature]

his Attorney.

No. 814,738.

PATENTED MAR. 13, 1906.

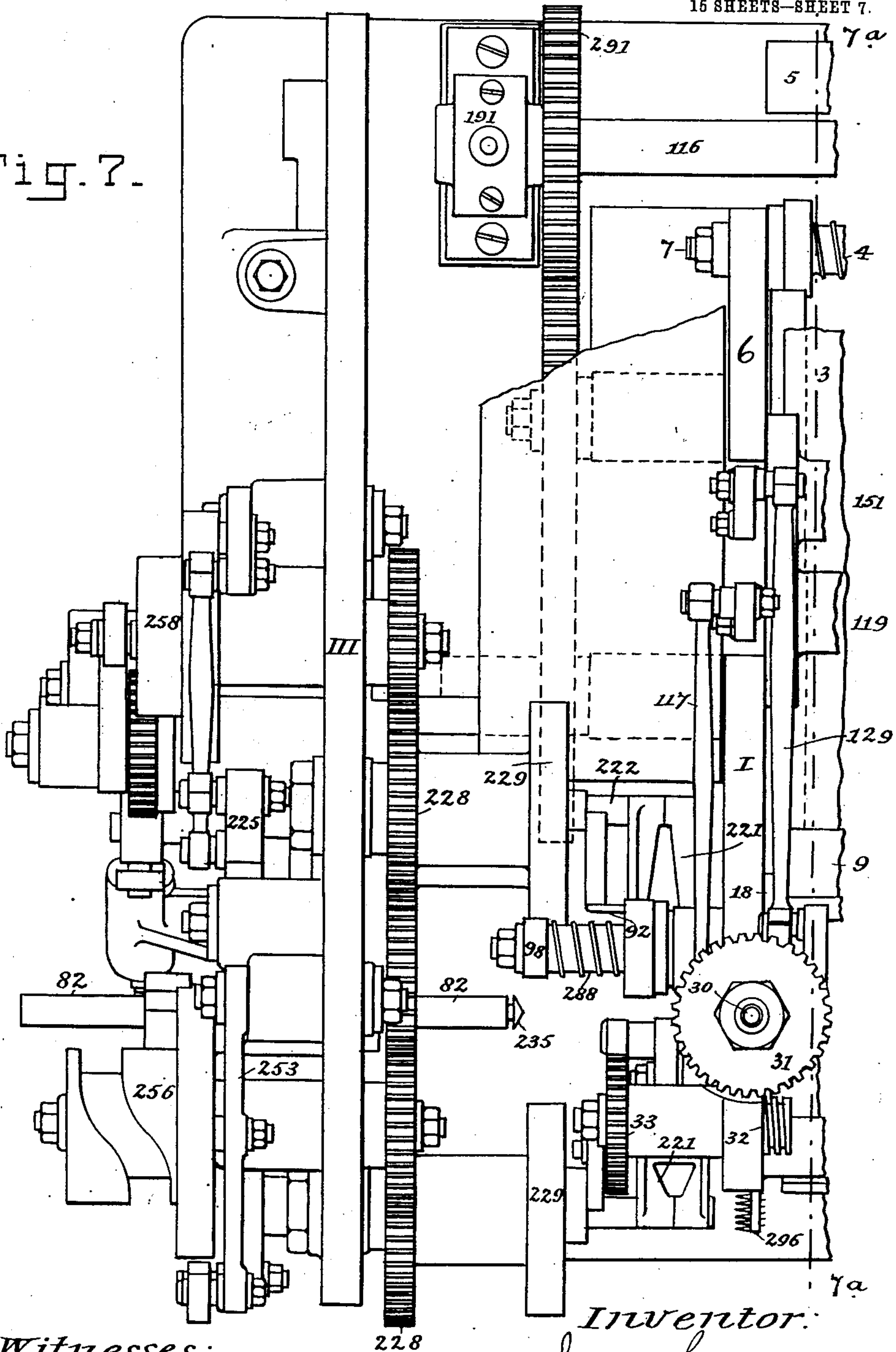
I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

16 SHEETS—SHEET 7.

Fig. 7.



Witnesses:

E. B. Botton

Adelaide Claire Gleason

Inventor:

Ivan Semenoff

By *Richard L. [Signature]*
his Attorney.

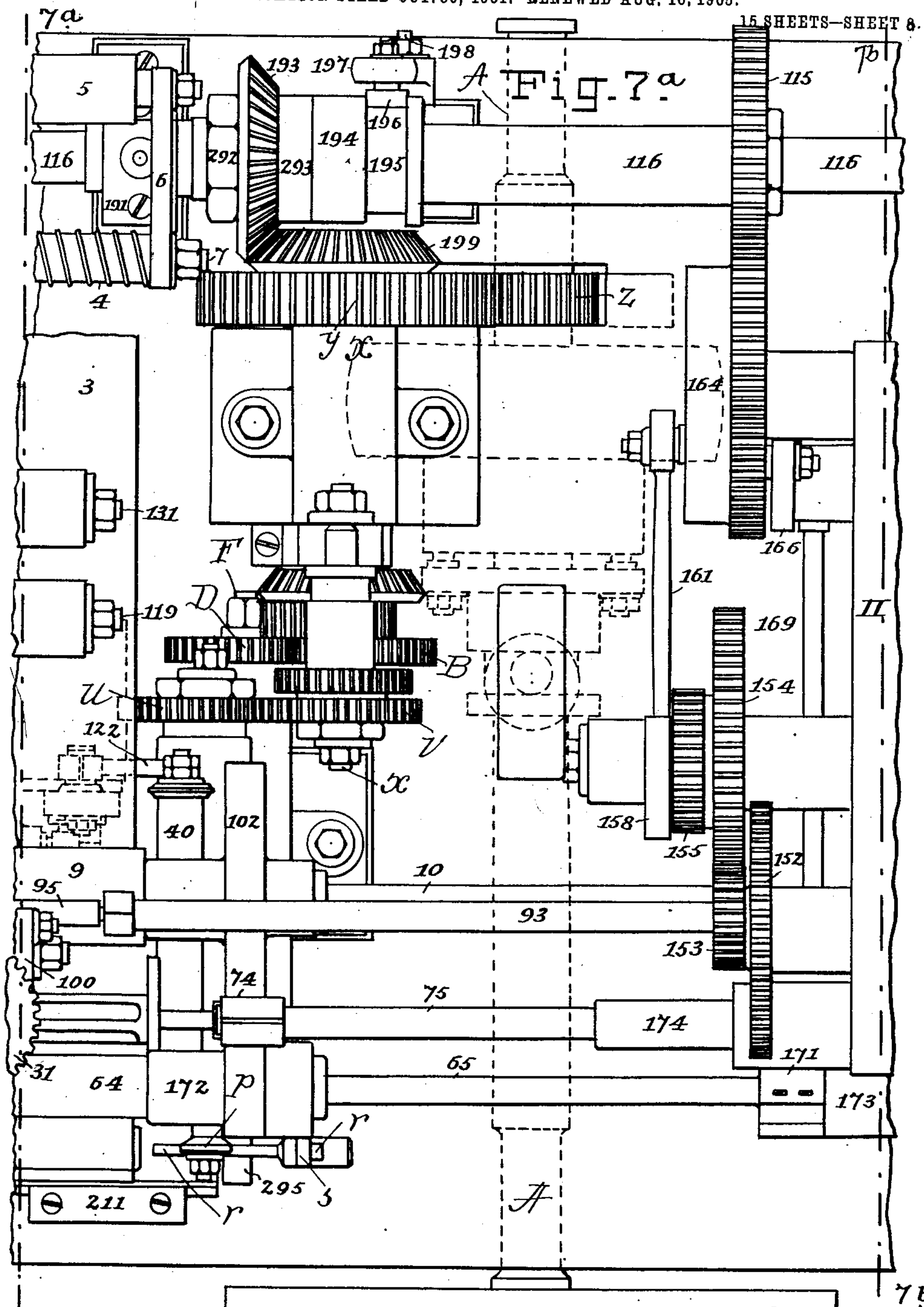
No. 814,738.

PATENTED MAR. 13, 1906.

I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.



Witnesses:

E. B. Bolton

Adelaide Claire Gleason

Inventor:

Ivan Semenov

Richard S. Richards
his Attorneys

No. 814,738.

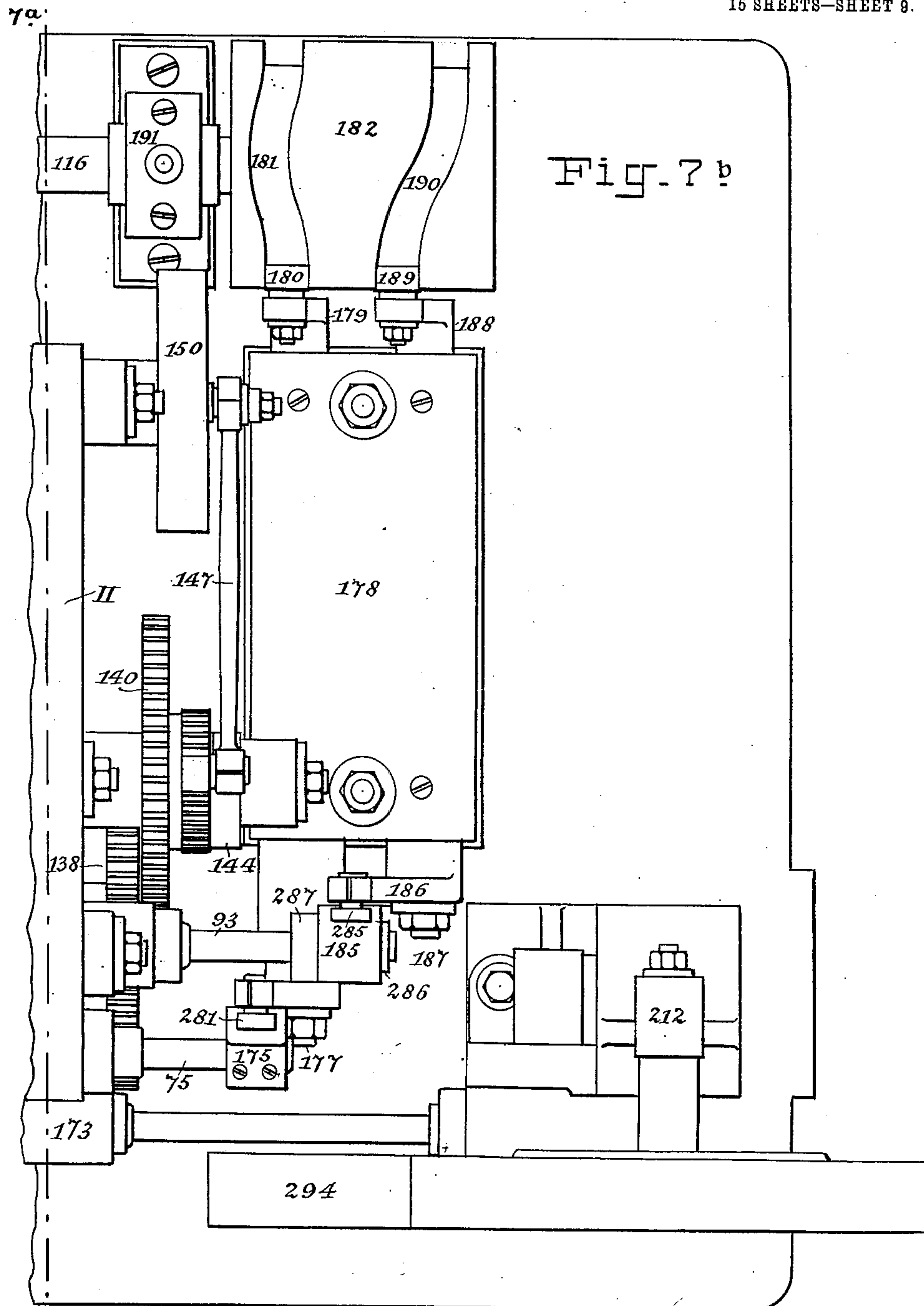
PATENTED MAR. 13, 1906.

I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 9.



7a

Witnesses:

C.B. Bolton

Adelaide Claire Gleason

Inventor:

Ivan Semenov

By *Richardson*

his Attorneys.

No. 814,738.

PATENTED MAR. 13, 1906.

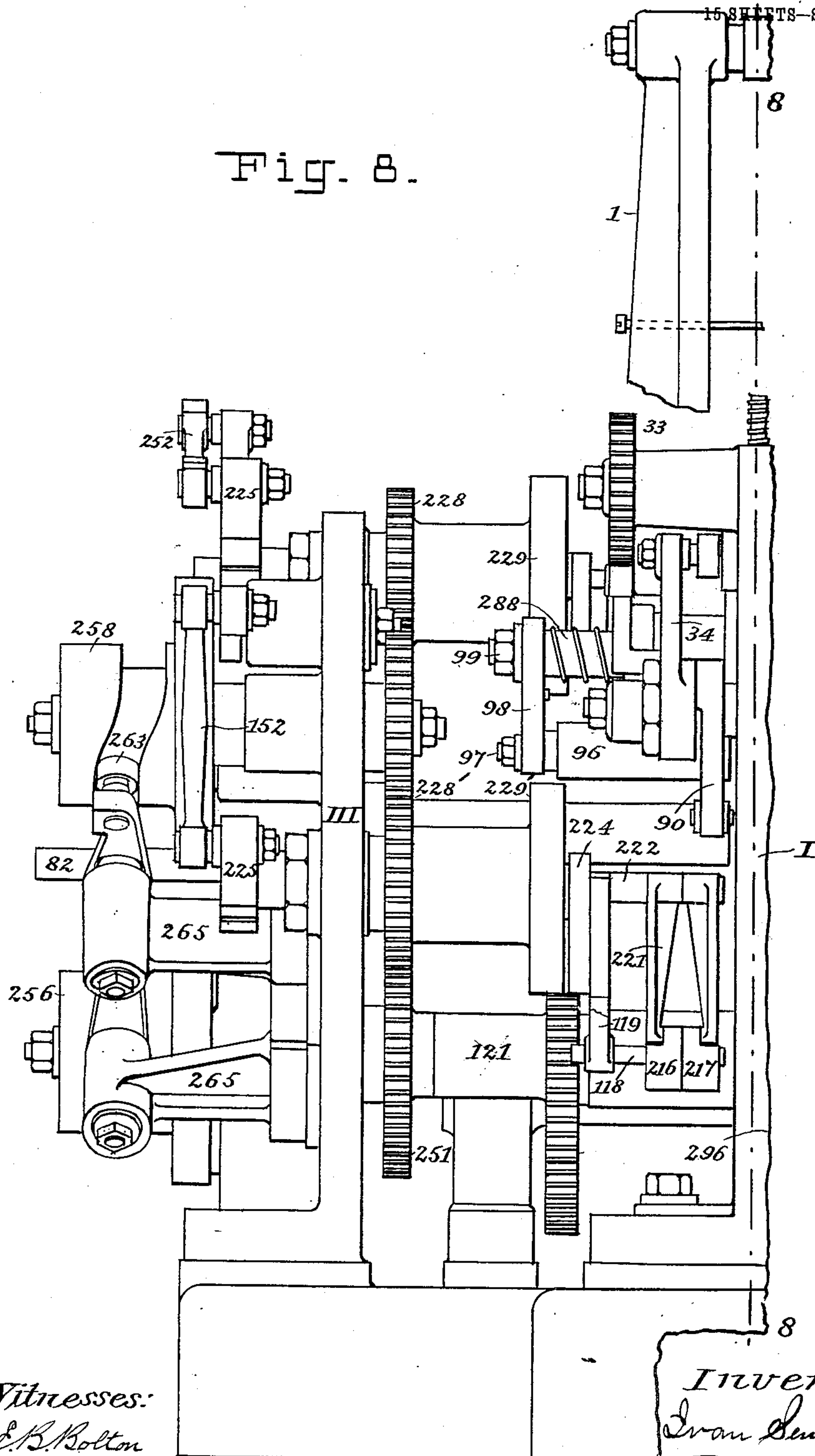
I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 10.

Fig. 8.



Witnesses:

E. B. Bolton

Adelaide Claire Gleason

Inventor:

Ivan Semenov

By Richard E.
his Attorneys.

No. 814,738.

PATENTED MAR. 13, 1906.

I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 11.

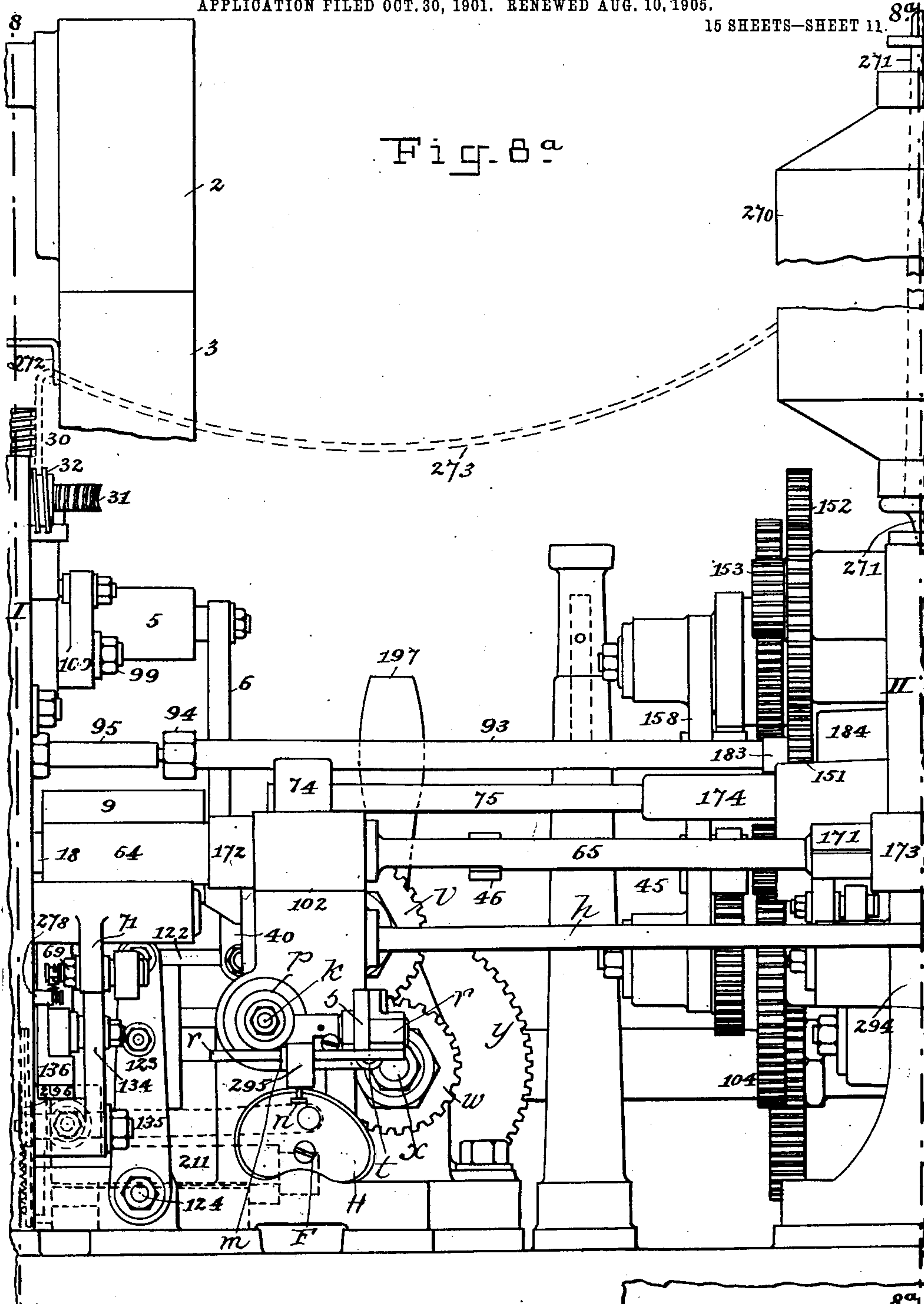


Fig. 8a

Witnesses:

E. B. Bolton

Osborne Oliver & Son

Inventor:
Ivan Semenov
By Richard R. [Signature]
His Attorney.

No. 814,738.

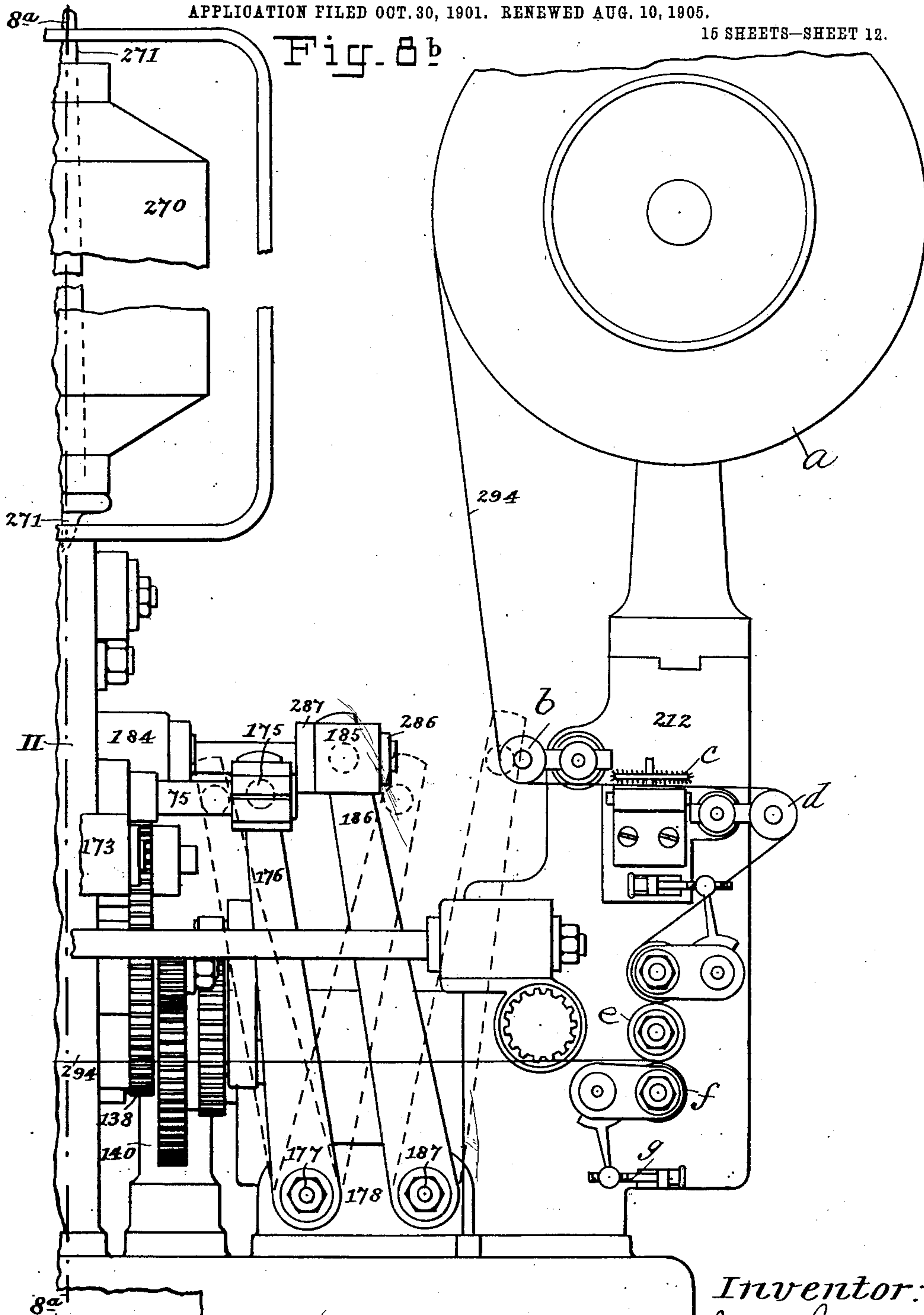
PATENTED MAR. 13, 1906.

I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 12.



Witnesses:

E. B. Holton

Adelaide Claire Gleason

Inventor:

Ivan Semenov

Richard M.

his Attorney

No. 814,738.

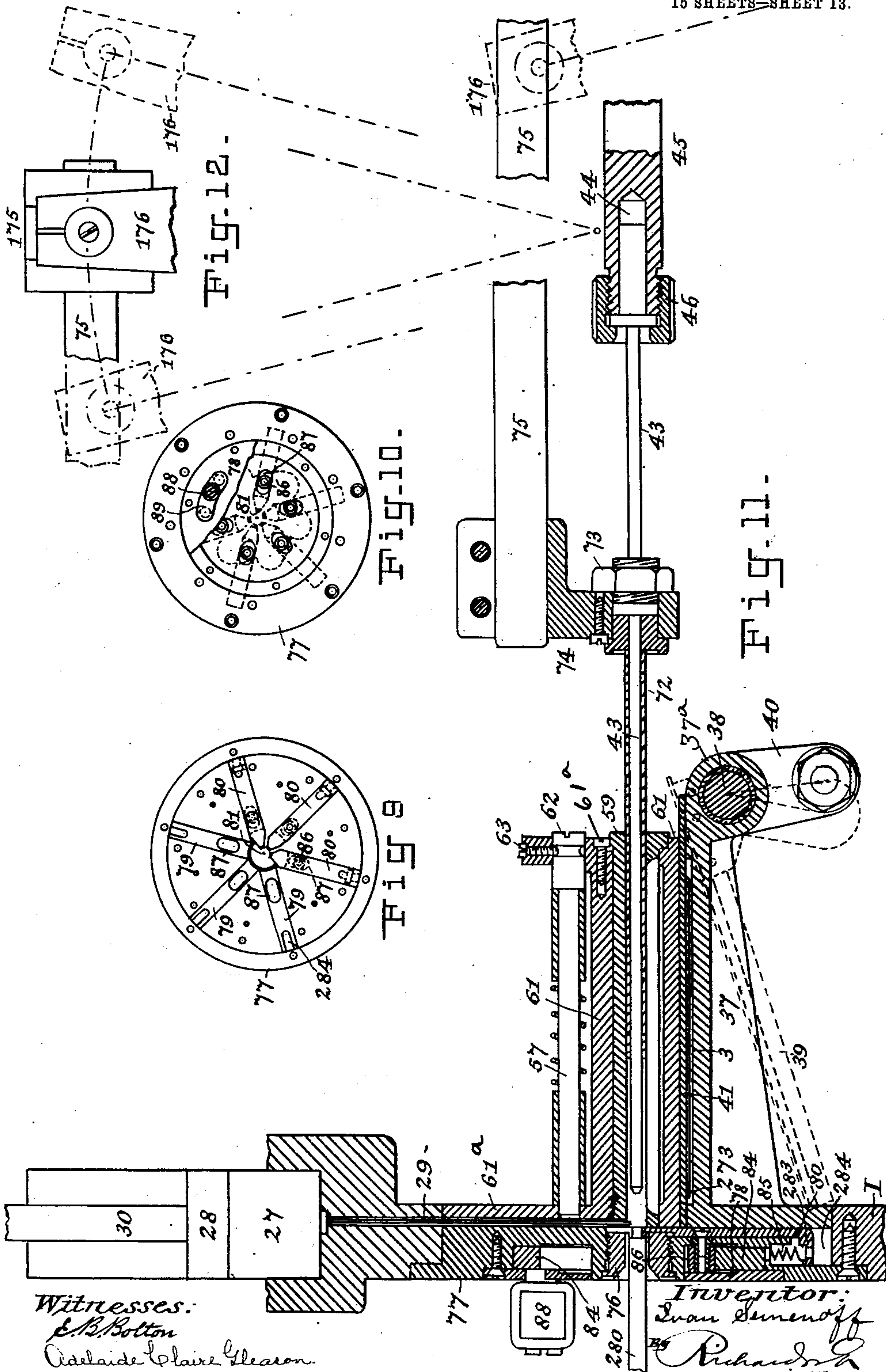
PATENTED MAR. 13, 1906.

I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

15 SHEETS—SHEET 13.



Witnesses:
E. B. Bolton
Adelaide Claire Gleason.

Inventor:
Evan Semenov
Richard A. [Signature]
Attorney.

No. 814,738.

PATENTED MAR. 13, 1906.

I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

16 SHEETS—SHEET 14.

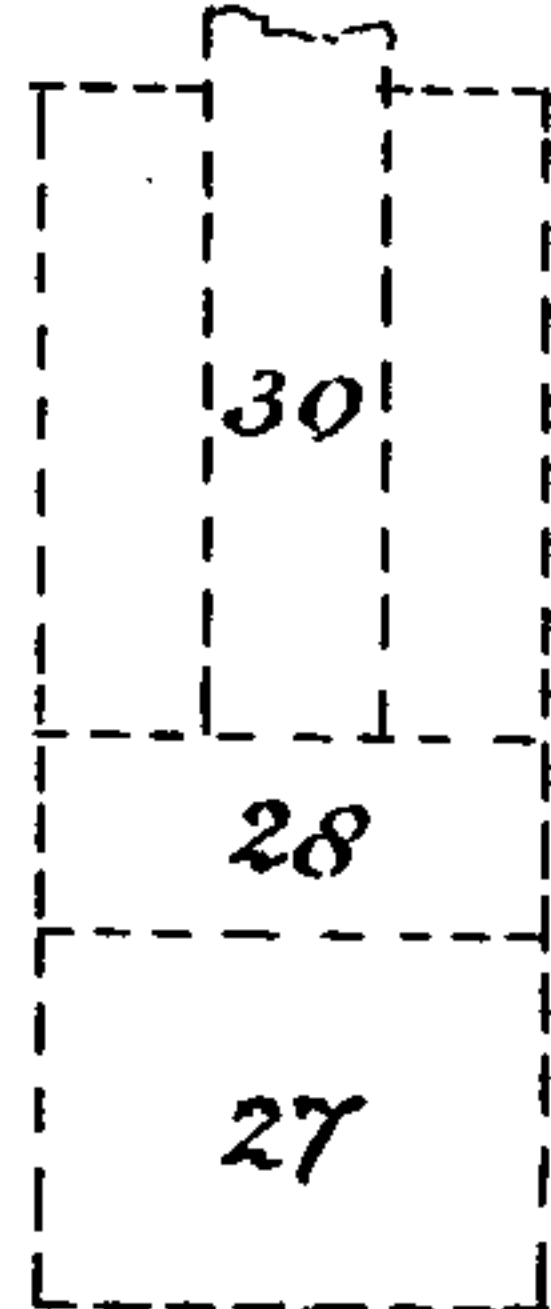


Fig. 13.

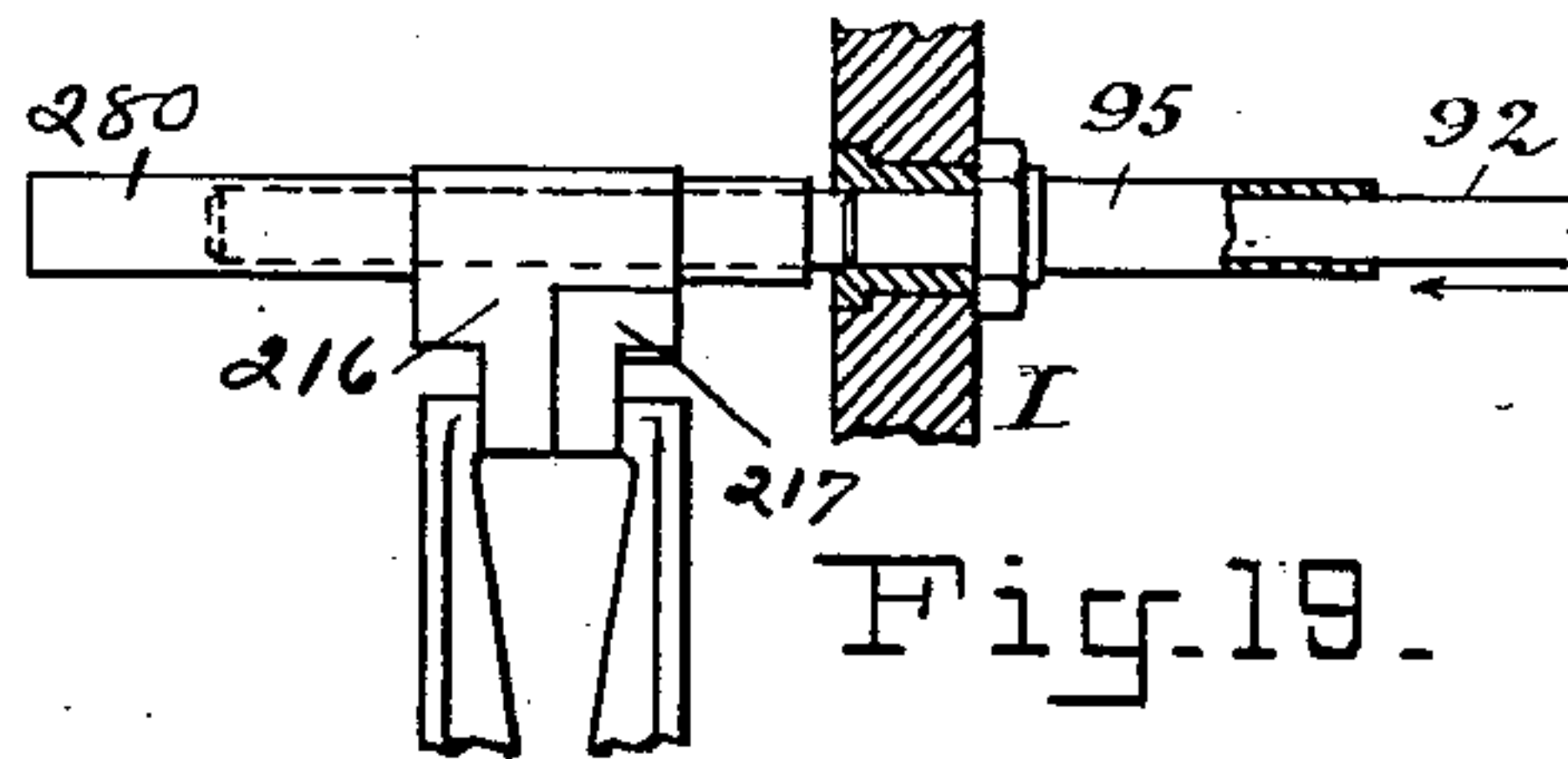


Fig. 19.

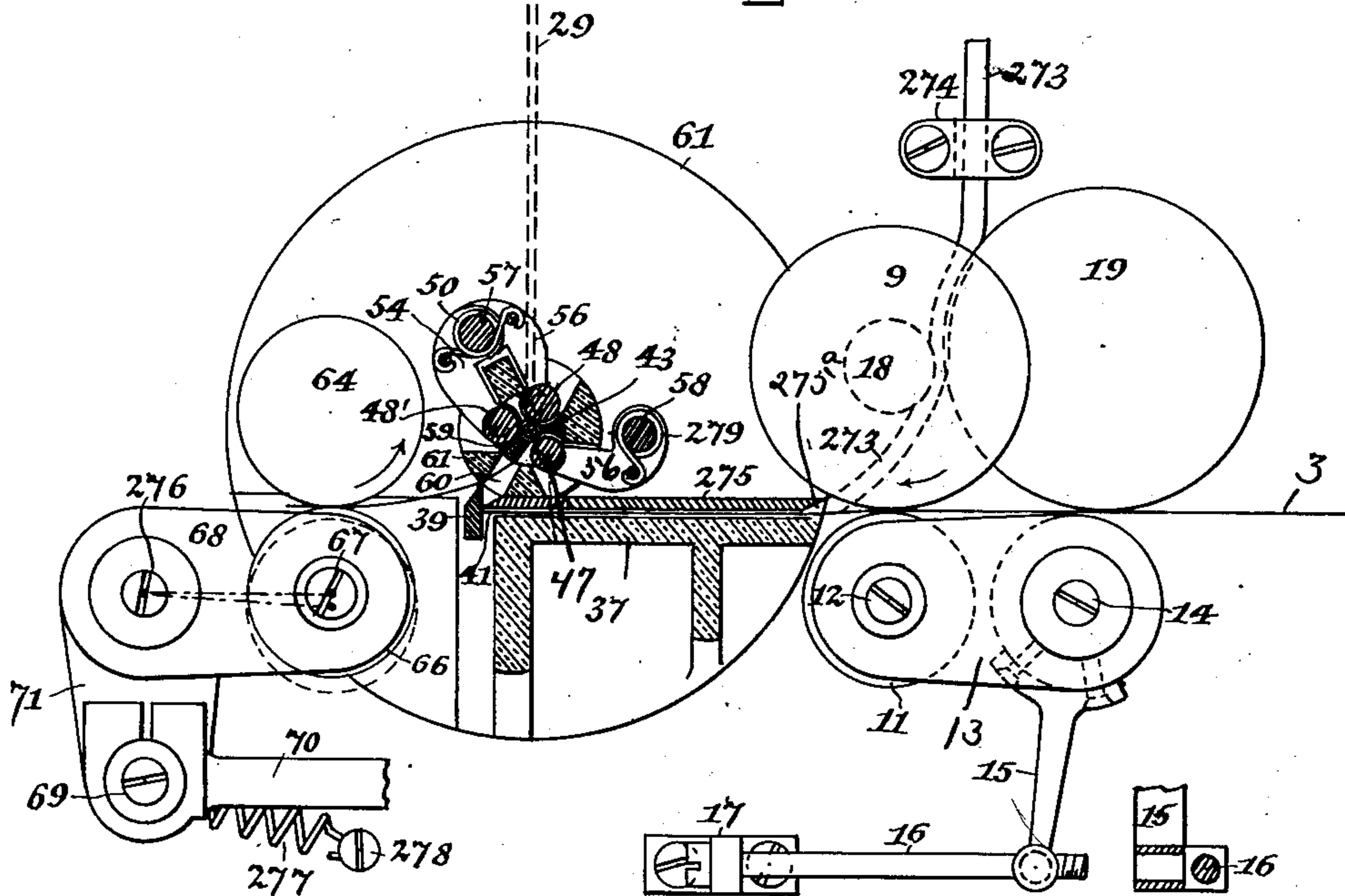


Fig. 14.

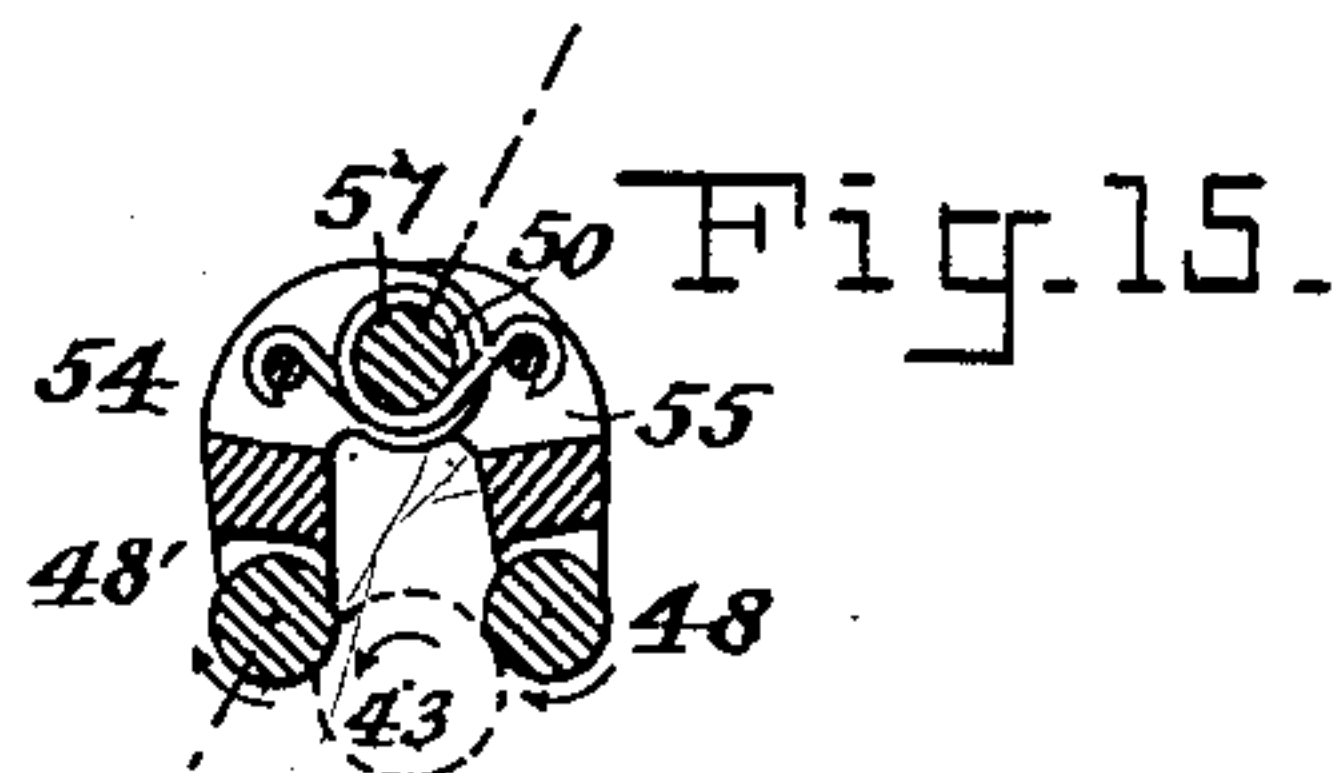
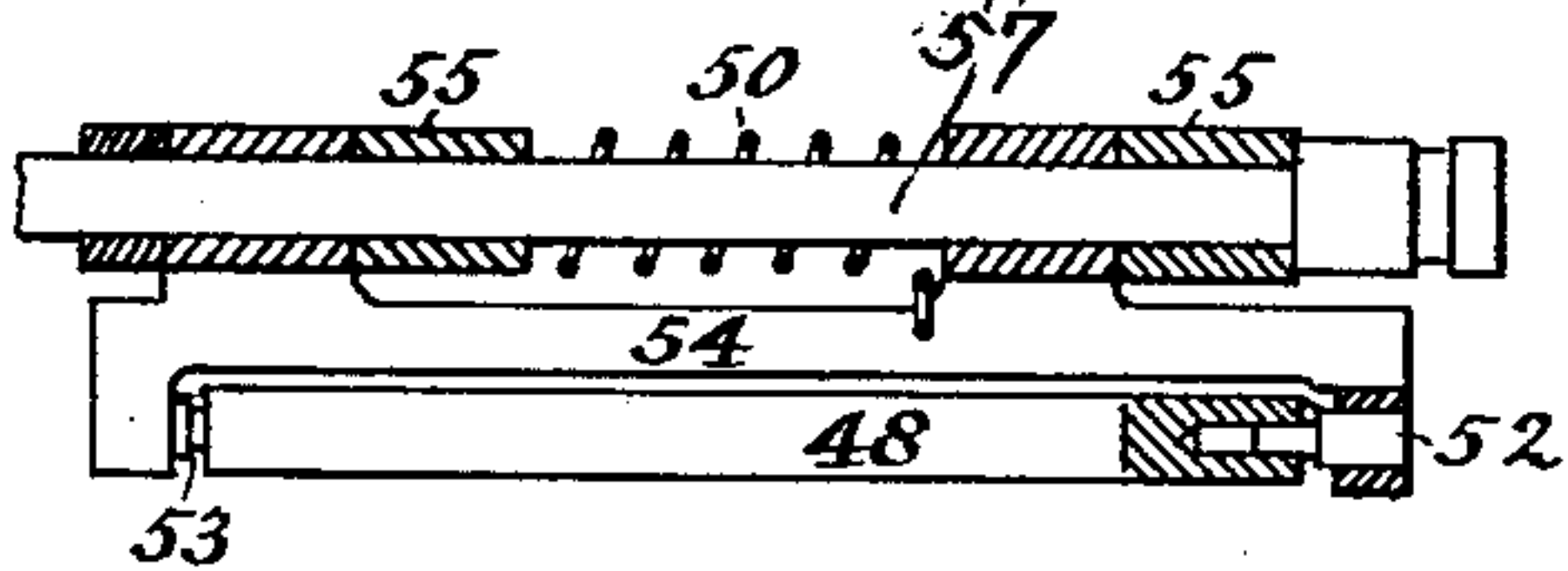


Fig. 15.

Witnesses:

C. B. Bolton

Udelaid, Claire Gleason.

Inventor:

Ivan Semenov

By Richard

his Attorneys.

No. 814,738.

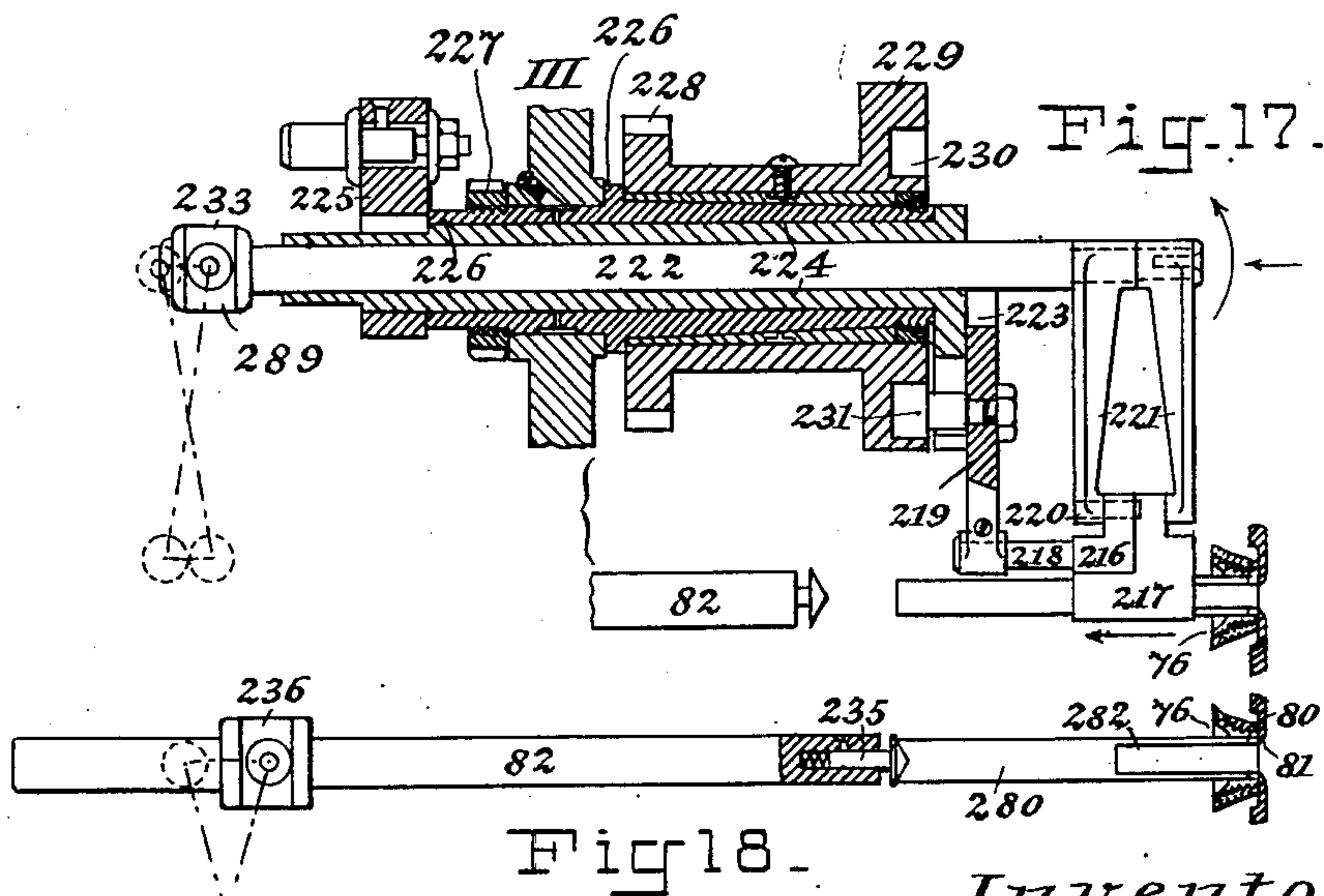
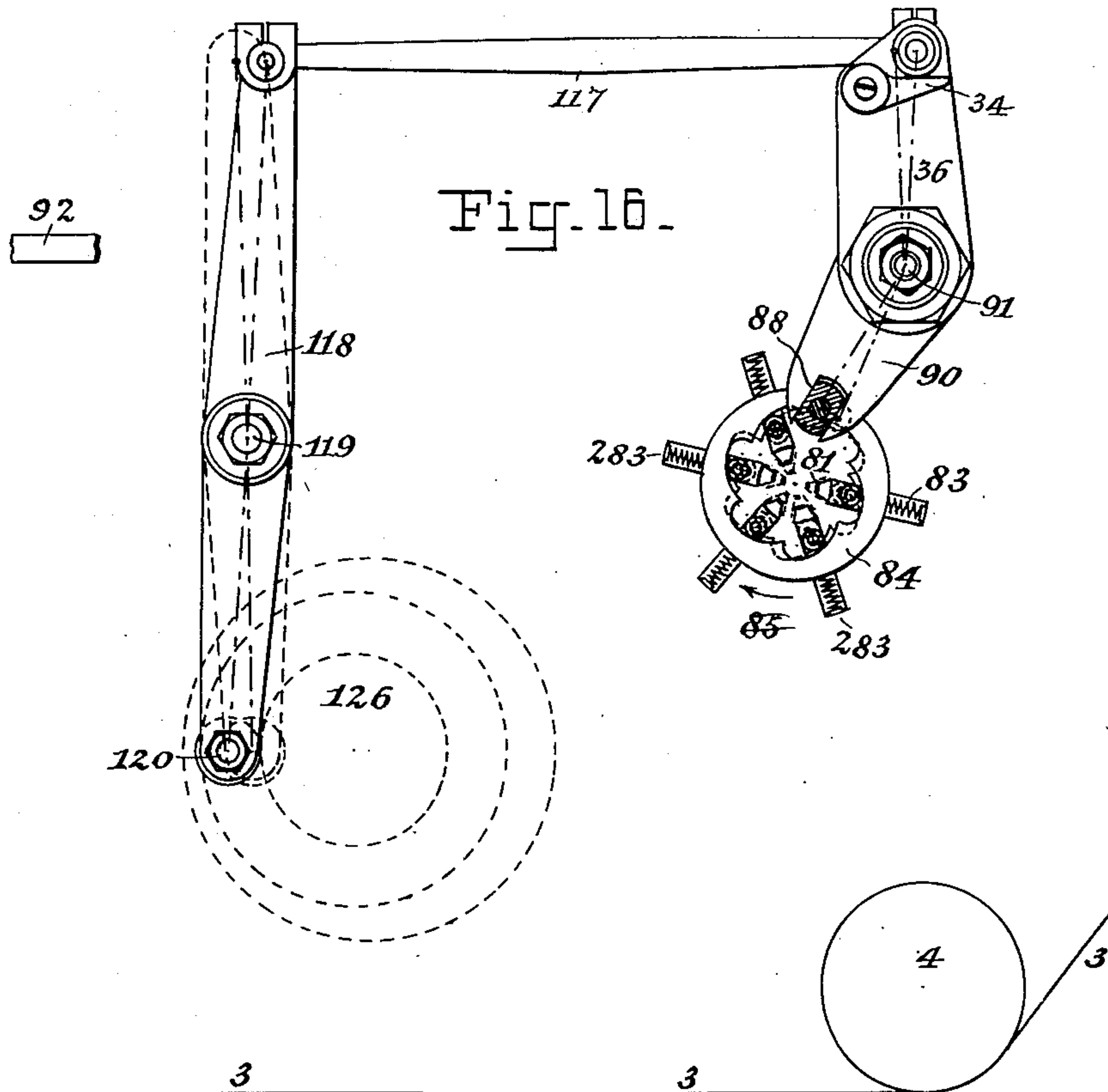
PATENTED MAR. 13, 1906.

I. SEMENOFF.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME
TO CIGARETTE TUBES.

APPLICATION FILED OCT. 30, 1901. RENEWED AUG. 10, 1905.

16 SHEETS—SHEET 15.



Witnesses:

E. B. Cotton

Adelaide Claire Gleason

Inventor:
Ivan Semanoff

By *Richard*
His Attorneys.

UNITED STATES PATENT OFFICE.

IVAN SEMENOFF, OF ST. PETERSBURG, RUSSIA.

MACHINE FOR MAKING PAPER MOUTHPIECES AND APPLYING THE SAME TO CIGARETTE-TUBES.

No. 814,738.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed October 30, 1901. Renewed August 10, 1905. Serial No. 273,674.

To all whom it may concern:

Be it known that I, IVAN SEMENOFF, a subject of the Emperor of Russia, and a resident of St. Petersburg, Russia, have invented certain new and useful Improvements in Machines for Making Paper Mouthpieces and Applying the Same to Cigarette-Tubes, of which the following is a specification.

The object of the invention is to form from a strip of paper a rolled-up mouthpiece with an insertion of fibrous material and to insert the same into a previously-formed cigarette-tube. To this end I provide means for severing a strip of paper into sections as the strip is fed from a reel or bobbin and for rolling up this strip into a mouthpiece with a filling of fibrous material. Thereafter the mouthpiece, with adhesive material applied thereto, is inserted into the cigarette-tube and subsequently expanded therein, so as to make the mouthpiece fit the tube closely, and the finished cigarette-tube, with its attached mouthpiece, is finally delivered to a suitable endless conveyer for transporting it from the machine.

The apparatus for forming and applying the mouthpieces is intended to work in conjunction with a machine for forming the cigarette-tubes; but as such cigarette-tube-forming machine is the subject of a separate application and forms no part of the present invention it is not described in detail herein.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation looking from the right of the supporting-plate or standard III shown in Figs. 7 and 8. Fig. 2 is a similar view looking from the opposite side of said standard. Fig. 3 is an elevation looking from the left-hand side of the central standard I, while Fig. 4 is a similar view looking from the right-hand side of the said standard. Fig. 5 is an elevation looking from the left-hand side of the right-hand standard II, while Fig. 6 is a similar view looking from the right-hand side. Figs. 7, 7^a, and 7^b, taken collectively, represent a plan view of the entire machine. Figs. 8, 8^a, and 8^b, taken collectively, show a front elevation of the entire machine. Figs. 9 and 10 are detail views of the cigarette-tube-holding mechanism viewed from opposite sides. Fig. 11 is a central vertical section, on an enlarged scale, through the mechanism for rolling the mouthpiece, showing also in dotted lines the knife for severing the strip to be rolled. Fig. 12 is a

detail of actuating parts. Fig. 13 is a sectional elevation of the rolling mechanism, the section being taken at right angles to the section of Fig. 11. Fig. 14 is a detail view showing the manner of supporting the rollers, and Fig. 15 is a cross-section of Fig. 14. Fig. 16 is a detail view of the means for operating the clips of the tube-holder and piston of the paste-pump. Fig. 17 is a detail sectional view of one of the sets of mechanism used to transport the cigarette-tube from one position of the machine to another. Fig. 18 is a detail view of the ram for pushing the cigarette-tube into the tube-holder. Fig. 19 is a detail view of the means for unrolling the tube.

Referring more particularly to the various figures, a machine is shown as provided with a base-plate III, to which are bolted three supporting plates or standards, numbered I, II, and III, in which are journaled the shafts, which carry the various working parts. The previously-formed cigarette-tube is brought by a suitable carrying mechanism, herein- after more fully described, into a position in line with the mouthpiece-forming mechanism and is there held until the mouthpiece is inserted. After the mouthpiece has been inserted a second carrying mechanism of a similar nature conveys the tube to a point where it is held while the mouthpiece is unrolled and firmly secured in position, from which point a third carrying mechanism conveys the finished tube and mouthpiece to a delivery-apron, all as will be more fully set forth in the proper place.

The paper or material out of which the mouthpiece is formed is fed from the bobbin 2, mounted on a bracket 1, carried by the central plate or standard I, as shown in Figs. 3 and 8. From this spool or bobbin 2 the paper is carried over a tension-roller 5, journaled in the outer ends of arm 6, pivoted upon a stud or bolt 7, passing through the plate I. From the tension-roller 5 the band passes beneath a guide-roller 4, journaled on a stud or spindle also carried by the frame I. From this guide-roller the strip of paper is carried forward in a straight line to the intermittent-feeding apparatus and severing means. The feeding apparatus for the strip comprises a feed-roller 9, under which the strip passes and against which it is pressed by an idle roller 11, journaled on a pin 12, carried by a frame 13, which is mounted to rock on a stud or pin 14, carried by a frame I.

An arm 15, secured to the rocking frame 13, is engaged by a screw-rod 16, passing through a bracket 17, by which the pressure of the roller 11 against the roller 9 may be varied at will. The roller 9 is mounted on a shaft 10, (see Fig. 7,) journaled in suitable bearings in the bracket 102 and the plate II. It is desirable that the feed-roller shall be intermittently rotated, so as to provide suitable intervals between the feeding of the strip for the formation of the severed part into a mouthpiece. To secure this intermittent rotary motion, I drive the shaft 10 as follows: A pinion 103, fast on the shaft 10, (see Fig. 5,) meshes with a gear-wheel 104, fast on the shaft 109. On this shaft is loosely mounted an arm 101, carrying a pawl 108, adapted to engage the teeth of a ratchet-wheel 105, secured to the face of the wheel 104. The arm 101 is oscillated by a pitman 110, connected to a pin 111, which is adjustably secured in a radial slot 112, formed in the face of the wheel 113. It will thus be seen that as the wheel 113 rotates the pitman 110 will be reciprocated and the arm 101 swung on its pivot, movement in one direction causing the pawl to ride over the ratchet-teeth, while movement in the opposite direction causes the pawl to engage the teeth, thereby turning the ratchet-wheel and imparting motion through the gearing before described to the feed-roller. I prefer to form the pawl 108 as a part of an arm 106, journaled on a pin *a*, so that when the pitman moves to the left the pawl will be drawn clear of the teeth of the ratchet-wheel, the upward movement of the pawl being limited by a stop 107, while as the pitman moves in the opposite direction the pawl is thrown positively in engagement with the teeth. Thus I avoid the necessity of any springs and secure a positive action of the pawl. By the arrangement just described I secure an intermittent motion of the feed-wheel 9, which is sufficient to supply the requisite amount of paper for a single mouthpiece.

In case it is desired to vary the size of the mouthpiece or the amount of paper used in forming the same owing to differences in the size of the cigarette-tube, this may be accomplished by the radial adjustment of the pin 111, so that it will impart to the beam 110 a greater or less movement.

It is desirable that a section of fibrous material—such, for instance, as cotton-wool roving—should be fed with the strip of paper to the cutting and rolling mechanism, so that it may serve to retain the tobacco within the cigarette-tube and act as a filter. To accomplish this, I provide a supply reel or spool 270, (see Figs. 5, 6, and 8,) which is journaled in a vertical position between bearings 270^a and 270^b of a bracket or standard 270^c, projecting up from the supporting-plate II. From this reel the cotton roving (indicated at 273)

passes over a hook or guide 272 and thence downward through a second guide or eye 274, directly above the edge of the paper and in line with the end of the feed-roller 9. On the end of the roller is a small fluted roller 18. (Shown in full lines in Fig. 8^a and indicated in dotted lines in Figs. 4 and 13.) The roving is pressed against this fluted roller by a presser-roller 19, journaled on a stud 20, carried by a swinging bell-crank lever 21, journaled on a stud 22, projecting from the frame I and pressed against the fluted roller by a spring 24, connected at one end to a pin or screw on the plate I and at the other end to the arm 23 of the bell-crank lever. After leaving the feed-roller 9 the paper passes between the supporting-plate frame-piece 37 and the upper plate 275, which is formed at one side with a guide or mouth 275^a, into which and over the edge of the paper the cotton roving is led, as indicated by dotted lines in Fig. 13. As the strip of paper with the superposed cotton roving is fed forward it passes between a stationary knife 41 and the base-plate 37 and continues on until it passes between the rollers 64 and 66, by which it is held taut until the pivoted knife-plate 39 rises and shears off the length necessary for the mouthpiece. Thereafter the rollers 64 and 66 operate to feed this strip back into the rolling mechanism, which is situated directly above the plate 41, in the manner which will be described later on. The knife and its operating mechanism is indicated in Figs. 7 and 8 and shown more in detail in Figs. 11 and 13. The outer end of the frame 37 is provided with a boss 37^a, in which is journaled a rocking shaft 38, to which the knife-plate 39 is rigidly secured. A crank-arm 40, rigidly connected to the shaft 38, is connected by a rod 122, Figs. 4, 7^a, and 8^a, to a lever 123, pivoted at 124 to a projection of the main frame and oscillated by means of a pin 125, engaging a groove in the cam 126. This cam is mounted on a shaft 127, which carries at its other end a gear-wheel 121, (see Fig. 3,) which receives its motion from gear-wheel 291 on the driving-shaft 116 through the interposition of the gear-wheel 132.

Referring to the rollers 64 and 66 for holding the strip while it is being severed and returning it to the rolling mechanism, these will now be more specifically described. The roller 64 receives an oscillating motion, so as to permit the unsevered strip to pass forward and then to feed the severed strip back, while the roller 66 is adapted to be alternately pressed against the roller 64 or dropped back into the position shown in dotted lines in Fig. 13. The roller 64 is rigidly secured on shaft 65, journaled in bearings in the bracket or standard 102 and in the plate II. On the shaft 65 is secured a crank-arm 171, (see Fig. 5,) provided with a pin 170, which is connected by a pitman 169 to the lever 166. The le-

ver is suitably pivoted at 167 to the supporting-plate and carries a pin or roller 165 at its opposite end, which engages a groove in the cam 164. This cam is toothed on its outer periphery to engage a gear-wheel 113, which meshes with gear 115 on the main driving-shaft 116. In this manner shaft 65, and with it roller 64, receives an oscillating movement. In order to raise and lower the roller 66, it is journaled on the stud 67, carried by the frame 68, adapted to oscillate on a supporting stud or shaft 276, which has a connected arm 71, to which a pitman 70 is connected at one end by a pin 69, as shown in Fig. 13. The other end of the pitman 70 is connected to the upper end of an arm 134, pivoted to the supporting-plate 135, and having a roller 136 adapted to engage the periphery of the cam B. The roller 136 is held in proximity to the cam by means of a spring 277, extending between a pin 278 on the plate I and the extremity of the arm 71, whereby the roller 66 is held pressed against the roller 64 until moved positively away from the same by the action of the cam B. While the paper band is being fed through the cutting mechanism preparatory to being severed the roller 66 is held by the arrangement just described out of contact with the roller 64, so that the paper may pass freely between the rollers. Just before, however, the knife-blade rises to sever the strip the roller 66 is raised and exerts a slight tension on the paper to hold it taut during the severing of the blank from the strip. As soon as the knife has severed the strip, owing to the inclined outer edge of the knife the severed strip or blank assumes the position shown in Fig. 13, and at the same time the roller 64 moves in the direction indicated by the arrow, and thereby feeds the rear edge of the blank into the mechanism which rolls it into a mouthpiece. This mechanism will now be described more in detail, having reference more particularly to Figs. 11 and 13. The rolling mechanism comprises a central spindle 43 and coacting rollers 47, 48, and 48', which press the paper around the spindle 43 as the latter rotates. These rollers are journaled in pivoted frames 54, 55, and 56, the two former of which are journaled upon a shaft or spindle 57, carried by the frame 61, which has a flanged portion 61^a, secured in an opening in the frame I. A helical spring 50, encircling the spindle 57, has its opposite ends connected to the frames 54 and 55 and tends to keep the rollers 48 and 48' pressed into contact with the spindle or mandrel 43. The other frame 56 is in a similar manner carried by a spindle 58 and pressed by a spring 279, so that the roller 47 will likewise be held in contact with the rollers. Within the frame 61 is located a guide tube or member 59, which insures the proper guiding of the paper. As the paper strip is fed backward through the slit 60 by action of the roller 64 it passes into the bight of the roller 47 and the spindle or the mandrel 43, and as the mandrel 43 rotates the blank is drawn successively between the rollers 47, 48, and 48' and the mandrel until it is coiled into a tubular mouthpiece. The spindle or mandrel 43 is secured by a nut 46 (see Fig. 11) to a shaft 45, which has a recess 44, into which the end of the mandrel is inserted. The shaft 45 is journaled in a long bearing or boss in the frame II and carries a gear 137, Fig. 6, which meshes with the gear 138. A gear 139, rigidly connected with the gear 138, meshes with the gear 140, which receives an oscillating movement by a pawl-and-ratchet mechanism. This comprises a ratchet-wheel 141, rigidly connected to gear 140, and an oscillating arm 144, pivoted on the axis 145 and carrying a pawl, the same being actuated by the pitman 147, connected to the pin 148, which is radially adjustable in the slot 149 of the crank-disk 150. The crank-disk is journaled on the same shaft 114 as the gear 113, which derives its motion from the gear 115 on the driving-shaft 116. It will thus be seen that an intermittent movement is imparted to the mandrel 43; but owing to the multiplying-gear just described a sufficient number of rotations of the mandrel is effected to insure the proper winding of the blank into a tube. I prefer to mount the rollers 48 on pins 52 and 53, as shown in detail in Fig. 14. I also prefer to clamp the tube 59 adjustably within the frame 61 by means of the set-screw 61^b, as indicated in Fig. 11. The shaft 57 is also preferably clamped in place in the frame 61 by a set-screw 63.

After the mouthpiece has been formed it is necessary to strip it from the mandrel and force it within the open end of the cigarette-tube, and to accomplish this I provide a stripping-tube 72, which encircles the mandrel and which is clamped by a nut 73 to a bracket 74, carried by a spindle or rod 75, to which a reciprocating movement is imparted by a lever 176, which is suitably clamped to a collar 175 on the rod 75, as indicated in detail in Fig. 12. Lever 176 is mounted on a shaft 177, journaled in the bracket 178. On the other end of the shaft 177 is secured an arm 179, provided with a pin or roller 180, engaging the cam-groove 181 in the cam 182, which is rotated by the main drive-shaft 116, as indicated in Fig. 7^b. The reciprocating motion of the ejector or stripper 72 above described causes the mouthpiece to be ejected from the inner tube or guide 59 into the cigarette-tube, which is indicated at 280 in Fig. 11.

Prior to the insertion of the mouthpiece into the cigarette-tube it is desirable that a drop of paste or like adhesive be applied to the exterior surface of the mouthpiece, so that it may be securely retained within the end of the cigarette-tube. To accomplish this, I provide a paste-reservoir 27, having a

duct or passage 29 leading down between plates 77 and 61^a and terminating in proximity to the end of the cigarette-tube. The paste is forced through the duct, so as to
 5 apply a drop to each mouthpiece by a piston 28, provided with a piston-rod 30, threaded at its upper end and held against rotary movement by any suitable means. A worm-wheel 31 is connected to a nut 31^a, threaded
 10 upon the rod 30, and this worm-wheel 31 engages a worm 32, formed upon or secured to a shaft journaled in the plate I, which at its opposite end carries a ratchet-wheel 33, the relative arrangement of these parts being clearly
 15 shown in Figs. 3, 4, and 7. The ratchet-wheel 33 is operated by pawl 34, carried by an arm 36, suitably pivoted to the plate I and operated by a pitman 117, connected to a rocking lever 118, pivoted at 119 and having
 20 its opposite end provided with a pin or roller 120, which engages a groove in the cam 126. (See Figs. 4 and 16.) Thus at each rotation of the cam a very slight movement is given to the piston sufficient to force a drop of
 25 paste through the conduit upon the exterior surface of the mouthpiece.

While the mouthpiece is being forced by the stripper 72 into the cigarette-tube 280, it will be readily understood that the cigarette-tube must be held against longitudinal movement with the end slightly enlarged, so as to permit the ready insertion of the mouthpiece and prevent contact or jamming of the respective parts. To accomplish this, I provide the construction which is shown in detail in Figs. 9, 10, 11, and 16. The cigarette-tube, as hereinbefore stated, is brought by a suitable carrying mechanism into line with the mandrel 43 and ejector or stripper 72 and
 40 is given a longitudinal movement toward these to insert it into the device by which the mouth is held expanded during the insertion of the mouthpiece. This carrying mechanism will be described in detail later on. Referring now, however, to the mechanism for holding the end of the cigarette-tube during the insertion of the mouthpiece, it will be seen that this comprises a tubular piece or socket 76, which has a central opening conforming in size to the cigarette-tube and which is screwed into the plate 77, which is clamped in the opening in the supporting-plate I. The socket 76 is made removable, so that different sizes of sockets may be used
 5 corresponding to the size of the cigarette-tube, and it is preferably flared at its outer portion to guide the cigarette-tube as it is brought into position by the carrying mechanism.

The means by which the end of the cigarette-tube is slightly expanded and held thus during the insertion of the mouthpiece comprises a plurality of radially-moving bars or rods 80, having grooved inner ends, which engage over the inner edge of the cigarette-tube.

These rods are held normally in their outermost position by springs 83, (indicated more clearly in Fig. 16,) connected to abutments 283 of the rods and having their opposite ends suitably connected to the supporting-plate. Near the center of each rod is secured a pin or roller 87, and these are encircled by a ring-shaped cam 84, having a plurality of inclines corresponding in number and position to the pins or rollers. All of these parts, as
 75 shown in Fig. 11, are carried within a recess in the plate 77 and confined in place by a covering-plate 78. It will be understood that the cam 84 is held in such position prior to the insertion of the cigarette-tube that the rods will be forced inward against the tension of the springs with their hooked inner ends in the position indicated in dotted lines in Fig. 16, so as to be within the circumferential edge of the cigarette-tube. After the cigarette-tube is in place a slight radial movement imparted to the cam allows the springs to draw the catches outward, whereby they engage with the cigarette-tube and hold it slightly expanded while the mouthpiece is being inserted. A reverse movement of the cam-ring releases the catches from the tube and allows the tube, together with the mouthpiece, to be removed by the carrying mechanism for subsequent treatment, as hereinafter described. The movement of the cam is effected by means of a pin 88, secured to the cam-ring and projecting through a slot in the covering-plate 78, which pin is engaged by an arm 90, carried by the pivot 91 and oscillated by the
 100 arm 36 from the cam 126 through a connecting rod or pitman 117 and rocking arm or lever 118, hereinbefore referred to.

To secure the ready insertion of the mouthpiece, it is found necessary to wind it into a tube slightly smaller than the cigarette-tube, and in order to make sure of its being permanently fastened or secured within the cigarette-tube it is necessary to unwind it again after it has been inserted in the cigarette-tube. For this purpose the cigarette-tube, with the attached mouthpiece, are conveyed by the carrying mechanism before referred to to a suitable finishing or unrolling mechanism, which will now be described. This comprises a spindle 92, Figs. 3 and 19, which has a reciprocating and intermittent motion, and a presser-roller 96, carried by an oscillating crank-arm 98. The spindle 92 is journaled in sleeve 95, secured by a nut 94 to the
 120 plate I, Fig. 19, and as the carrying device (indicated at 216 217) brings the cigarette-tube into line with the spindle 92 the latter is moved longitudinally into the cigarette-tube, as indicated at 280. Then a rotary motion is imparted to the spindle 92 in a direction reverse to that in which the mouthpiece was wound, whereby the mouthpiece is unwound and expanded, so that its gummed outer surface is forced into tight contact with the in-
 130

ner surface of the cigarette-tube. After the spindle 92 has made several rotations it is withdrawn from the cigarette-tube and the latter is transported to the receiving-table, as hereinafter described. For effecting the reciprocating motion of the spindle 93 it is provided with a collar 185, having a slot in which moves a slide 285, secured by a pivot-pin to an arm 186, mounted on a shaft 187, journaled in the abutment 178. The opposite end of this shaft carries an arm 188, provided with a pin or roller 189, meshing with a cam 190 in the cam 182, before referred to. (See Fig. 7^b.) Rotary motion of the shaft 93 is effected by means of the pinion 151, splined to the shaft 93, which meshes with gear 152, rigidly connected with gear 153, which in its turn meshes with the gear-wheel 154, to which an intermittent motion is imparted by the crank-disk 164 in the manner hereinbefore described. The arm 98, carrying the presser-roller 97 above referred to, oscillates on a spindle 99, mounted in frame I, to which an oscillating motion is imparted by the crank-arm 100, connected by rod 129 to the lever 130, pivotally mounted at 131 on a bracket carried by the frame I and rocked by means of a pin or roller 132, engaging a groove in the cam 133. (See Figs. 3, 4, 7, and 8.) In order that the pressure of the roller 97 may be a yielding pressure, the arm 98 is connected to the spindle 99 by a spring 288, as shown in Figs. 7 and 8.

I will now describe the mechanism by which the cigarette-tube is conveyed through the machine, which means I have hereinbefore referred to as the "carrying means." This carrying mechanism comprises three sets of carrying-arms numbered, respectively, A, B, and C. The first of these receives the cigarette-tube from the tube-forming mechanism and conveys it to the point indicated at 215, Fig. 1, where the mouthpiece is inserted. The second of these, B, takes the tube, with the inserted mouthpiece, and conveys it to the point indicated at 232, where the unrolling or expanding mandrel or shaft acts upon it, and the third set of carrying-arms C takes the finished cigarette from the point 232 and conveys it to the endless traveling apron 237, by which it is fed to a receiving-table 238. As these carrying-arms are substantially identical, I will for convenience and brevity describe only the second set, (indicated at B.) These are shown in side elevation in Fig. 1 and in sectional view in Fig. 17. Within the frame-plate III is mounted a tubular bearing 226, within which is rotatably journaled a sleeve 224, which carries at the right-hand end of Fig. 17 two guides 223, between which is mounted a slide 219. Within the slide 224 is located a shaft 222, which carries at the right-hand end (shown in Fig. 17) two arms 221.

A pair of gripping-jaws 216 217 are pivoted together upon a pin 218; and the rear ends of

these arms are connected one to one of the bars 221 and the other to the other bar by means of pins 220. The pin 218 is extended sufficiently to engage the slide 219. Upon the tubular bearing 226 is journaled a sleeve 70 having at one end a gear 228 and at the other end a cam 229, having a cam-groove 230, in which engages a roller 231, bolted to the slide 219, as shown. When the gear 228 is rotated by the gear connections shown, the cam 229 75 is rotated, and by reason of the cam-groove and roller 231 the slide 219 will be drawn in and out or toward and from the shaft 222. This means that the pin 218 will be likewise moved, and as the pin 218 moves inward from 80 the position shown in full lines in Fig. 1 it will be seen that the arms 221 will be spread apart and the jaws opened into the position shown in dotted lines. Thus it will be seen that the rotation of the cam 229 controls the opening 85 and closing of the jaws 216 and 217. In order to swing the jaws from the position in which they receive the tube from the preceding mechanism to the position in which they deliver it to the succeeding mechanism, a 90 crank-arm 225 is connected to the sleeve 224, which is connected by a pitman 252 to an arm 253, pivoted at 254 and having a roller 255, engaging a groove in the cam 257, mounted on the shaft 260. By this construction it 95 will be observed that the guides 223 are swung back and forth, so that the jaws are moved to and fro to effect the conveying or carrying of the cigarette-tube and that this movement is entirely independent of and unaffected by 100 the opening and closing of the jaws, and vice versa. In order that the arms may readily extract the cigarette-tube from the holder, the shaft 222 is given a slight reciprocating motion, the pin 218 being sufficiently long to 105 permit this. This reciprocating motion is effected by providing a collar 233, encircled by a sleeve 289, to which is connected a lever 262, rocking on a spindle 264, journaled in a bracket 265 and operated by a roller 263, en- 110 gaging a groove in the cam 257.

For pushing the cigarette-tube into the holder a special ram is provided, working in combination with the first carrying-arm, this being shown in detail in Fig. 18. This con- 115 sists of a cylindrical rod or shaft 82, Figs. 2, 7, and 18, having a longitudinal reciprocating motion in a long boss or bearing in the frame III and operated by a rocking lever 262', connected at one end to the shaft or 120 pusher 82 by connection 236 and at the other end carrying a roller 263', operated by the cam 259. The end of the pusher 82 preferably carries a yielding buffer 235, having a conical end for bearing against the outer end 125 of the cigarette-tube.

From the foregoing description it will be readily seen how the cigarette-tube is carried from the tube mechanism in successive steps through the machine by the three sets of car- 130

rying mechanism described and finally delivered upon the endless belt 237. This belt passes around a drive-roller 239 and a tension-roller 242 and is further supported by a plate 245, attached to the bracket 246. The belt receives an intermittent motion from the ratchet-wheel 240, operated by the arm 241 and pawl carried thereby and the rod 266 from the disk of cam 258, the pitman of rod 266 being connected thereto by a pin 267, radially adjusted in the slot 268. The tension of the belt may be regulated by shifting the bracket 243 along the frame III, to which it is clamped by plates 244, as shown in Fig. 1.

The mechanism described in connection with the supporting-plate III receives its motion from a shaft 260, which is transmitted by gear-wheel 251 through the various gears shown. The mechanism on the frame II receives its motion from the wheel 115, Figs. 5 and 7, keyed on the shaft 116. The reciprocating motion of the ejector 72 and of the unrolling-spindle 92 is derived from a cam 182, which is also keyed on the shaft 116. This shaft 116, which thus imparts motion to the whole mouthpiece mechanism, is intended to be driven itself by the cigarette-tube-making machine.

It is desirable that the connections between the tube-making machine and the drive for the mouthpiece-applying machine shall be detachable and adjustable. To secure this result, I provide the construction shown at the top of Fig. 7^a, in which the gear *y* represents the main driving-gear of the cigarette-tube-making machinery. To this is rigidly connected a bevel-gear 199, which meshes with a bevel-gear 193, loosely mounted on a boss 293, to which it may be rigidly connected by a nut 292. The boss 293 is mounted to rotate freely on the shaft 116, but is held against longitudinal movement thereon by any suitable means. (Not shown.) Adjoining this boss is clutch member 194, splined to the shaft 116 and capable of being moved thereon to engage and disengage the boss 293 by the roller 196 engaging a groove 195. The roller 196 is carried by the lever 197, pivoted to 198. By these connections it will be seen that after connecting the collar 194 with the boss 293 and releasing the bevel-gear 193 I may revolve the mouthpiece-machine until it stands in conformity with the tube-machine. Then by clamping the wheel 193 by the nut 292 the two machines may be operated in unison. Should, however, it be desirable to drive the tube-machine alone without affecting the relative adjustment, this may be done by simply disengaging the clutch member 194 from the boss 293, when the bevel-gear will revolve freely without rotating the shaft 116.

I claim as my invention—

1. In combination in a machine for making and applying mouthpieces to cigarettes,

a supply-roll for the paper from which the mouthpieces are to be formed, means for feeding a strip of cotton-wool roving upon one edge of said paper strip, and intermittently-operating means for rolling a section of said strip into a mouthpiece with the roving within the same, substantially as described.

2. In combination in a machine for applying mouthpieces, rolling mechanism, feeding mechanism consisting of a pair of rollers, one of which is a feed-roll and the other a presser-roll, means for imparting to the feed-roller a backward and forward rotary movement and means for imparting to the presser-roller an oscillating movement, the said feed-roller first drawing the paper taut and then forcing the same into the rolling mechanism, substantially as described.

3. In a machine of the class described, the combination with rolling mechanism, and means to support a paper strip located on one side thereof, of feed-rollers located on the opposite side of said rolling mechanism, severing mechanism located between the feed-rollers and rolling mechanism, and means for rotating said feed-rollers first in one direction and then in the other, whereby a portion of the paper is drawn taut over the severing mechanism, severed and then returned to the rolling mechanism, substantially as described.

4. In a machine of the class described, the combination with gripping devices for holding the end of a cigarette, winding means, means for rotating said winding means to wind a paper tube of a smaller exterior diameter than the interior of the cigarette end, means to move the tube into the cigarette end, and means operating within the tube to partially unwind said tube in said end, substantially as described.

5. In a machine of the class described, the combination with gripping devices for holding the end of a cigarette, winding means, means for rotating said winding means to wind a paper tube of a smaller diameter than the interior of the cigarette end, means to move the tube into the cigarette end, and exterior and interior devices coacting upon said tube and cigarette to unwind the tube.

6. In a machine of the class described, the combination with gripping devices for holding the end of a cigarette, winding means, comprising a solid central spindle and coacting rollers bearing against the surface of said spindle, means for rotating said winding means to wind a paper tube of a smaller diameter than the interior of the cigarette end, means to move the tube into the cigarette end, and exterior and interior devices coacting upon said tube and cigarette to unwind the tube.

7. In a machine of the class described, a disk having a central tube or thimble, radially-moving catches or hooks adapted to

engage the end of a cigarette to expand said end against said thimble, means for rolling a paper-tube mouthpiece, and means for inserting the same in said expanded end, substantially as described.

8. In combination in a cigarette-mouthpiece-applying machine, means for holding the cigarette-tube comprising a disk with a removable socket, catches moving radially of the said socket for pressing the cigarette-tube against the socket and means for introducing the mouthpiece-tube into the cigarette-tube, substantially as described.

9. In combination in a cigarette-mouthpiece-applying machine, means for transporting the tubes consisting of jaws, a slide

for opening and closing said jaws, means for reciprocating the slide radially, levers carrying the jaws, and means for imparting a rotary movement to the said levers.

10. In combination in a cigarette-mouthpiece-applying machine, a tube-holder and means for pushing the cigarette-tube into the tube-holder consisting of a ram with a buffer and means for reciprocating the ram, substantially as described.

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

IVAN SEMENOFF.

Witnesses:

N. TSCHERKULOFFEL,
K. JOURARLEFF.