

No. 671,417.

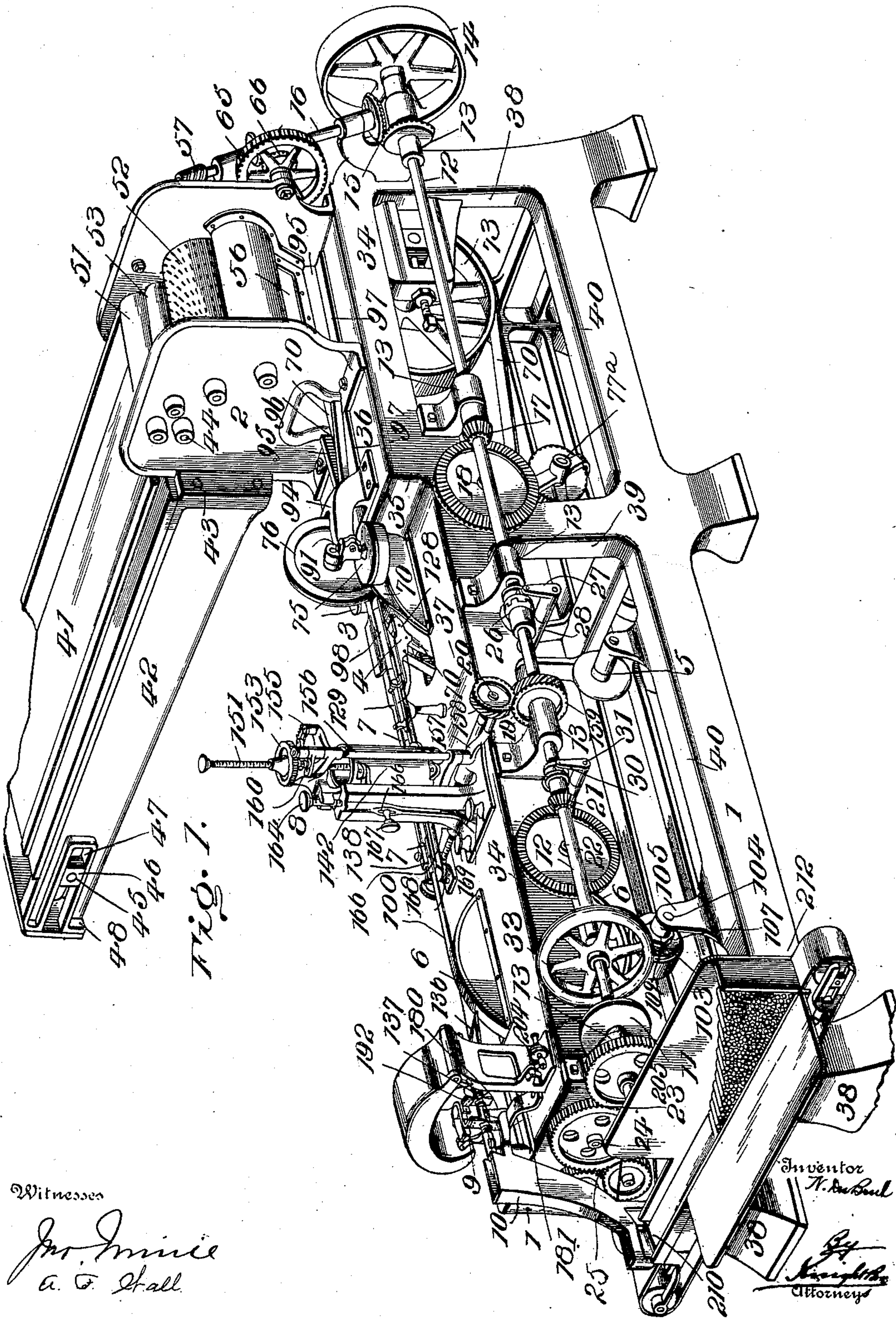
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(No Model.)

(Application filed Apr. 3, 1900.)

21 Sheets—Sheet 1.



No. 671,417.

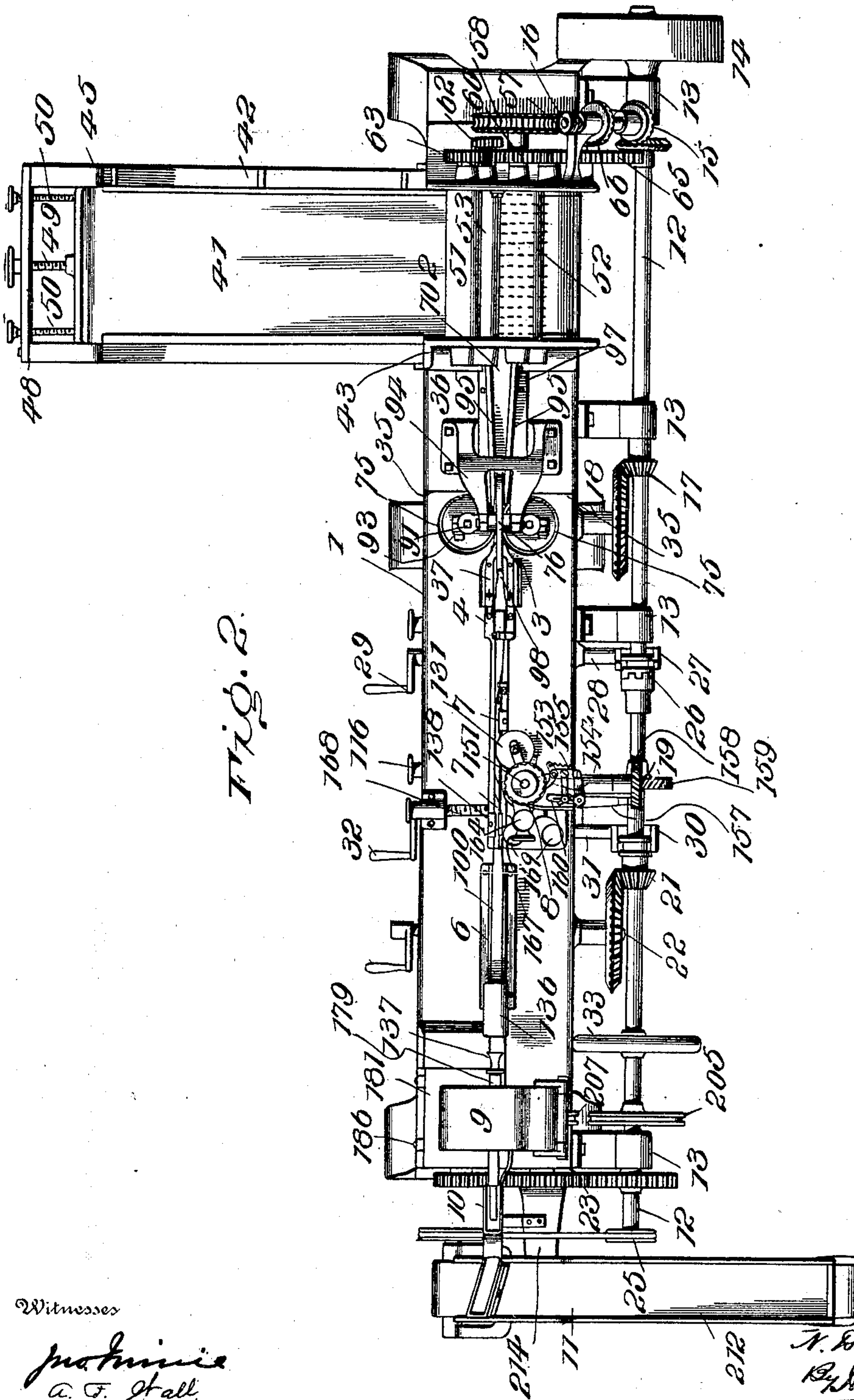
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 2.



Witnesses

Johnnie
A. F. Hall.

Inventor

N. Du Brul
By Knight Bros
Attorneys

No. 671,417.

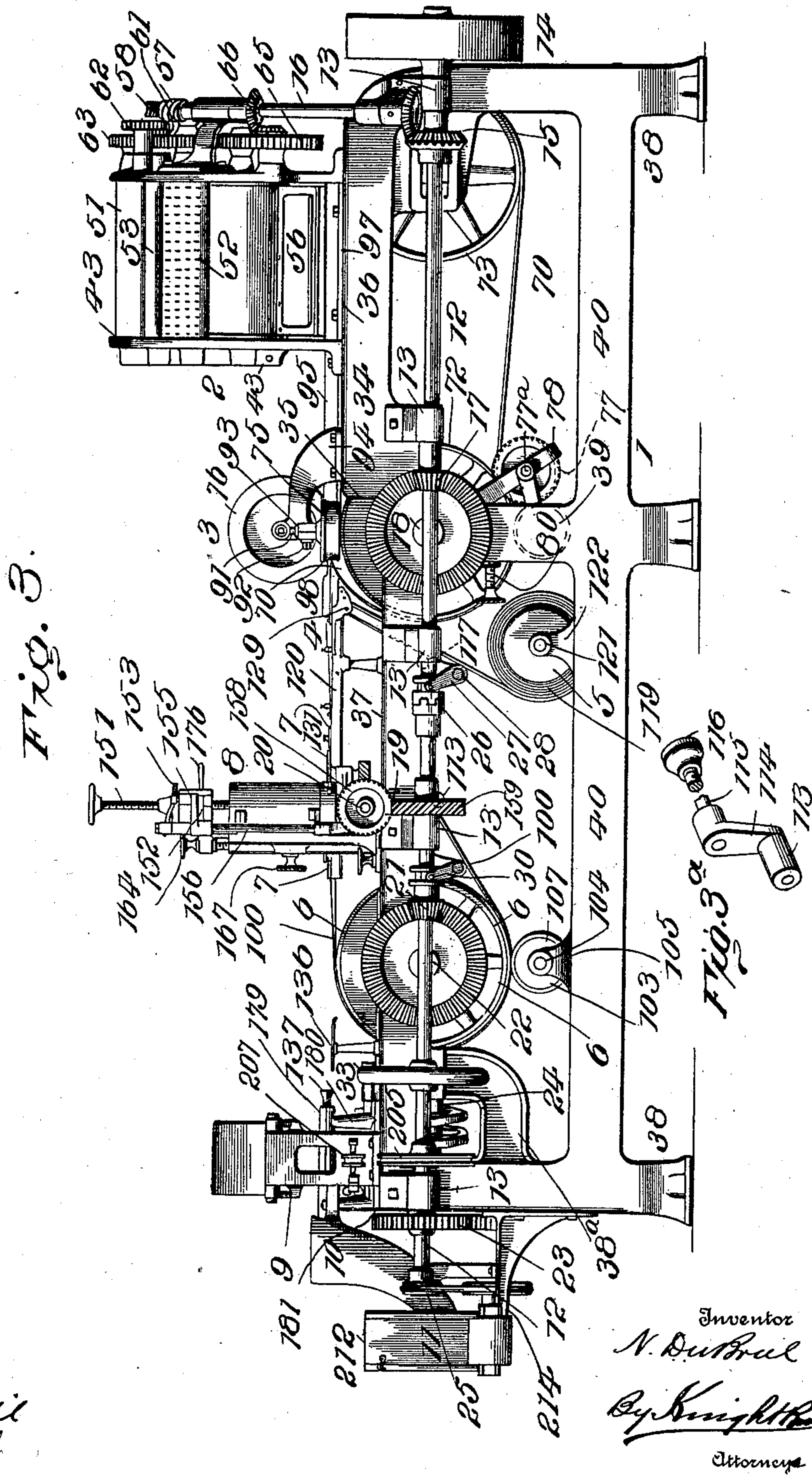
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 3.



No. 671,417.

Patented Apr. 2, 1901.

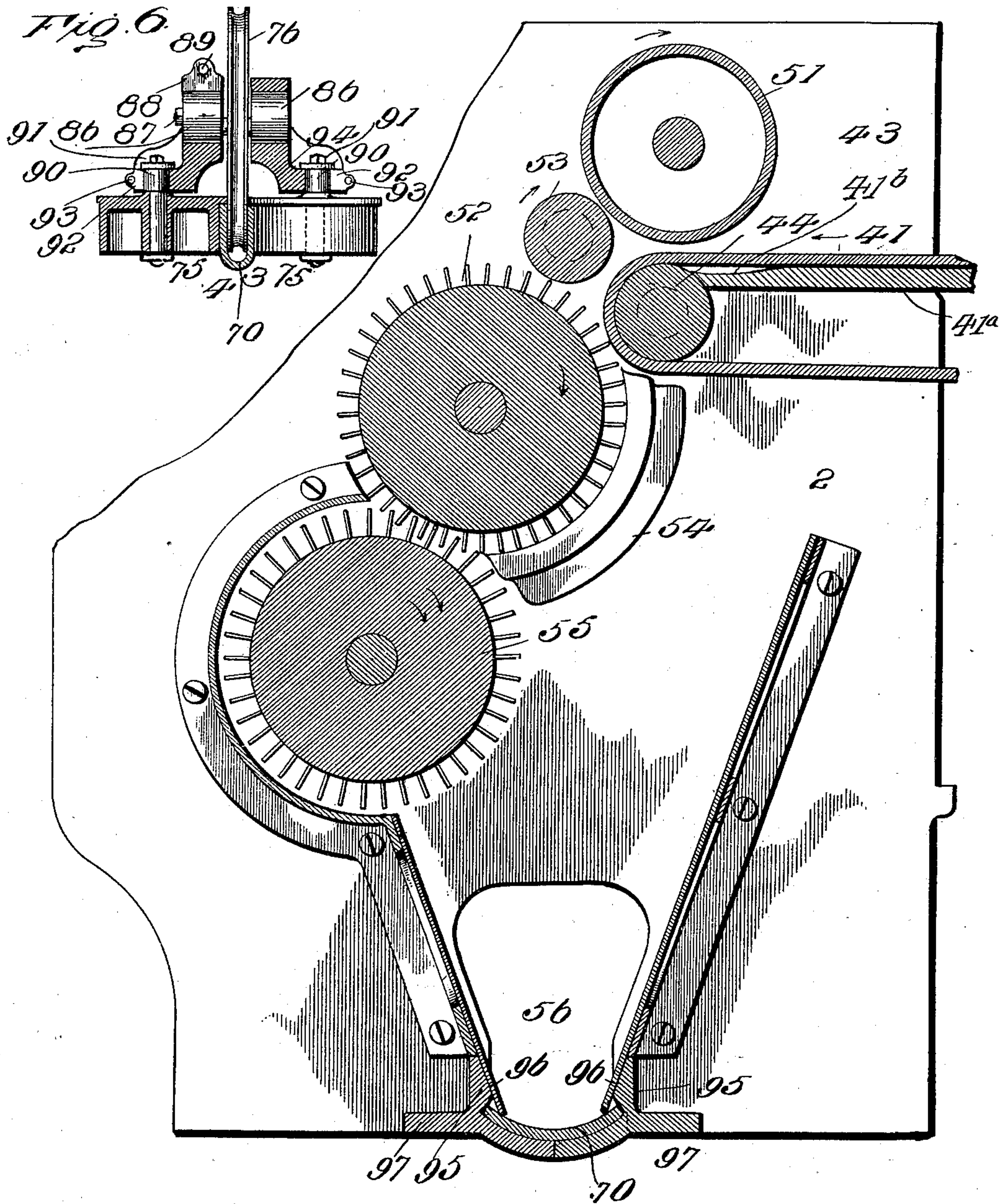
N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets-- Sheet 5.

Fig. 5.



Witnesses

Witnesses
J. M. Mice
A. F. Hall.

Inventor

N. Dev. Deal
By Knight ~~Deal~~
Attorneys

No. 671,417.

Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 6.

Fig. 7.

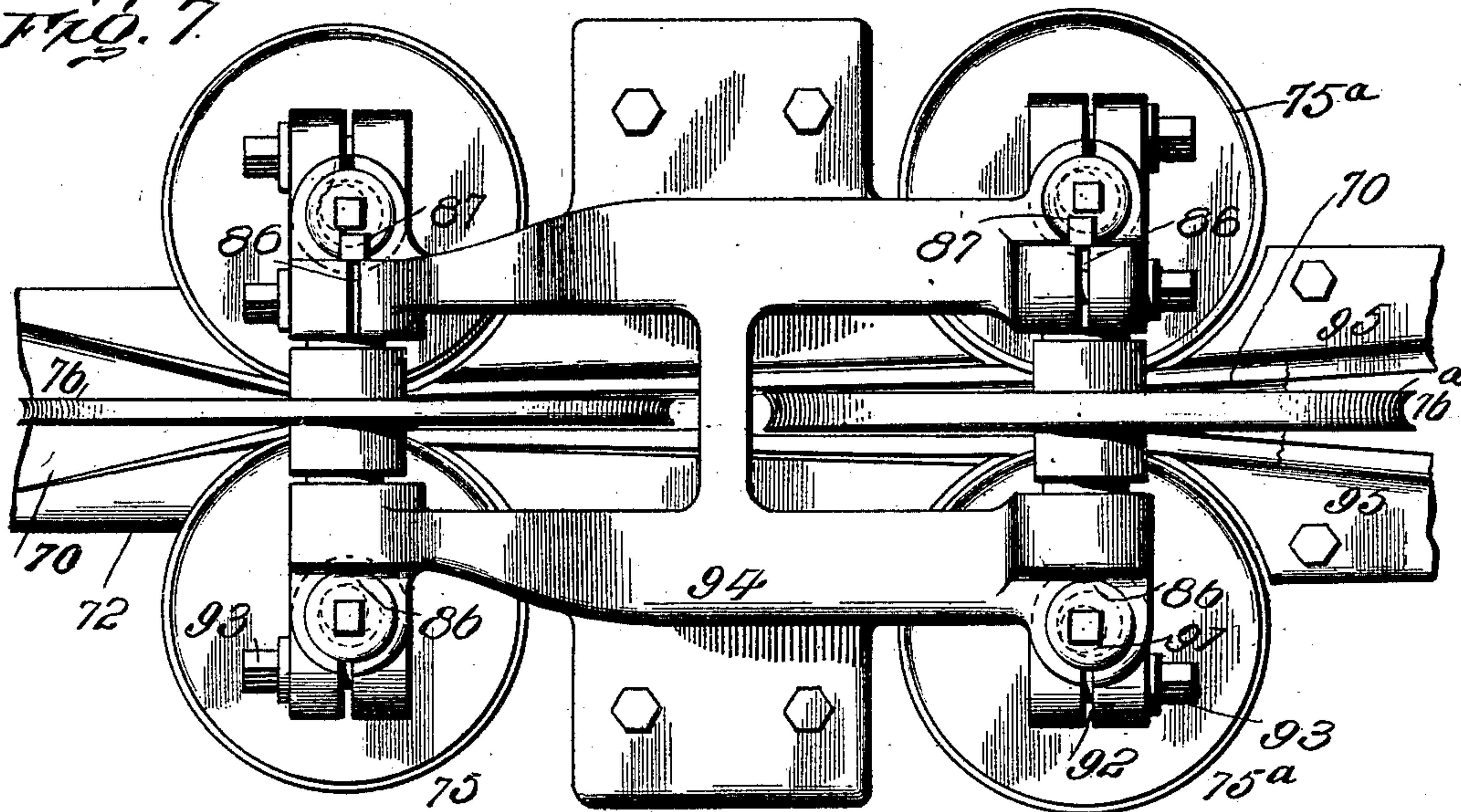
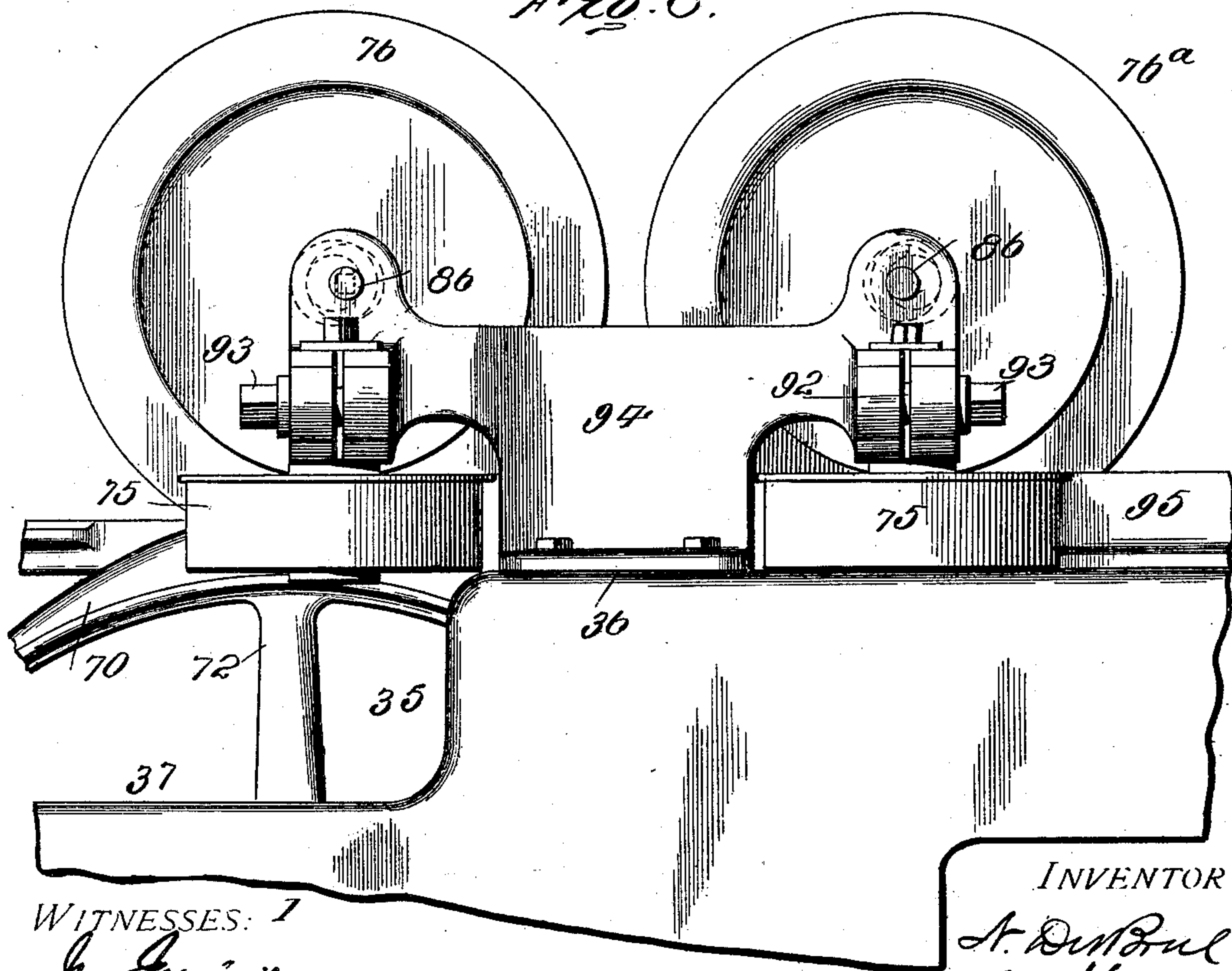


Fig. 8.



WITNESSES: 1

John J. Smith
a. & Hall

BY

INVENTOR

N. Du Brul
By Knight

Attorneys

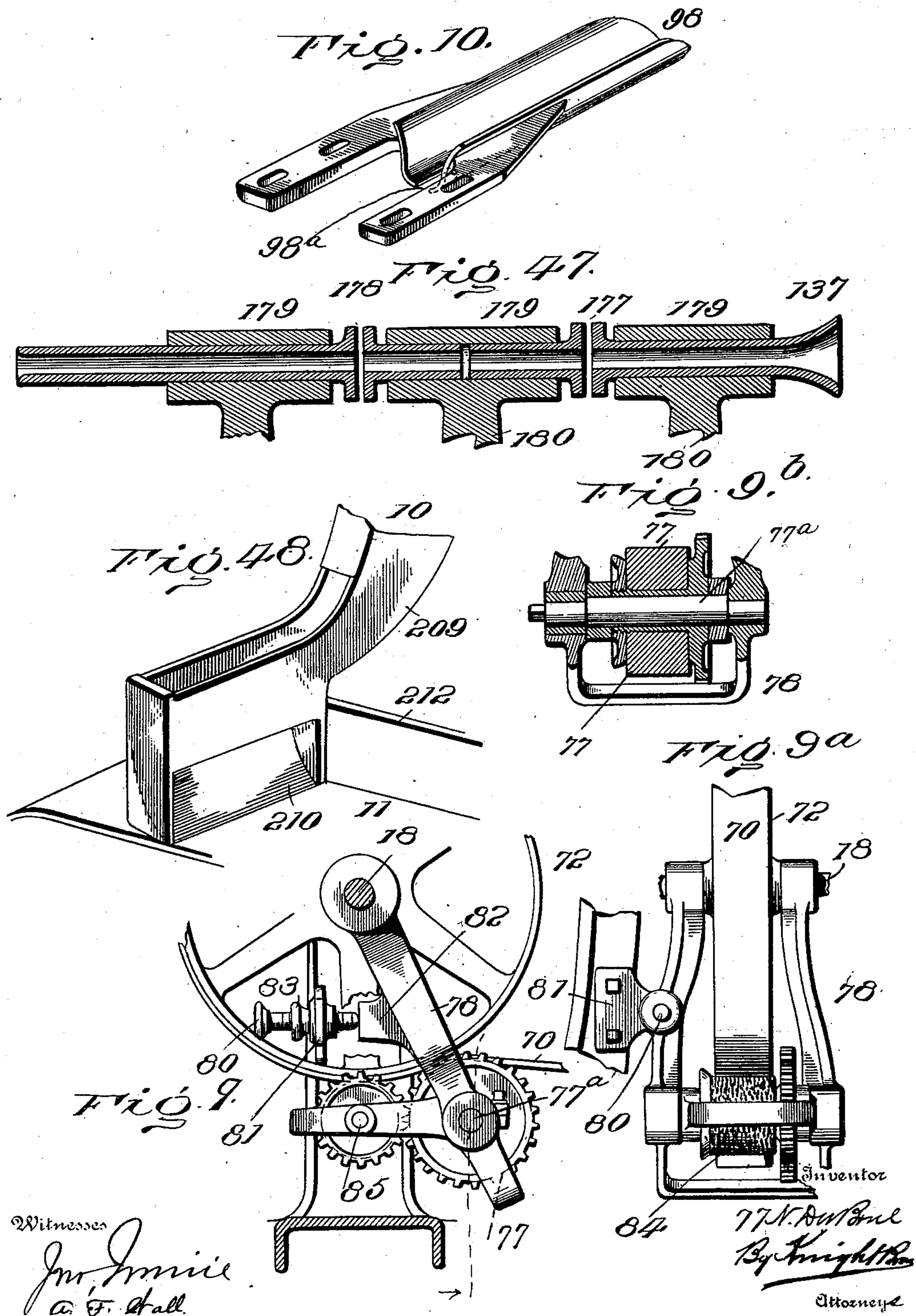
No. 671,417.

Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE,
(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 7.



No. 671,417.

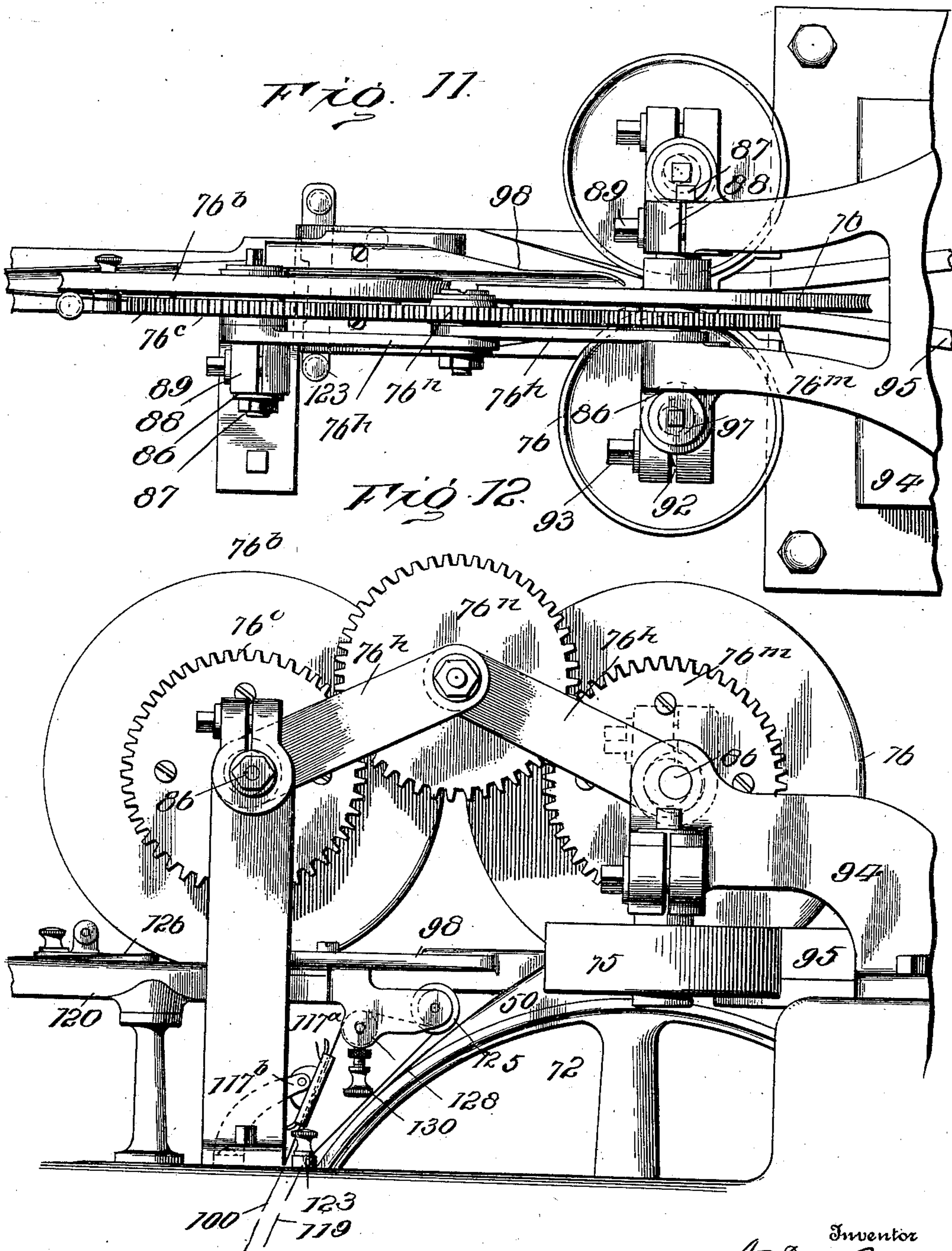
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(No Model.)

(Application filed Apr. 3, 1900.)

21 Sheets—Sheet 8.



Witnesses

J. M. M. M.
A. F. Hall.

Inventor

N. Du Brul
By Knight

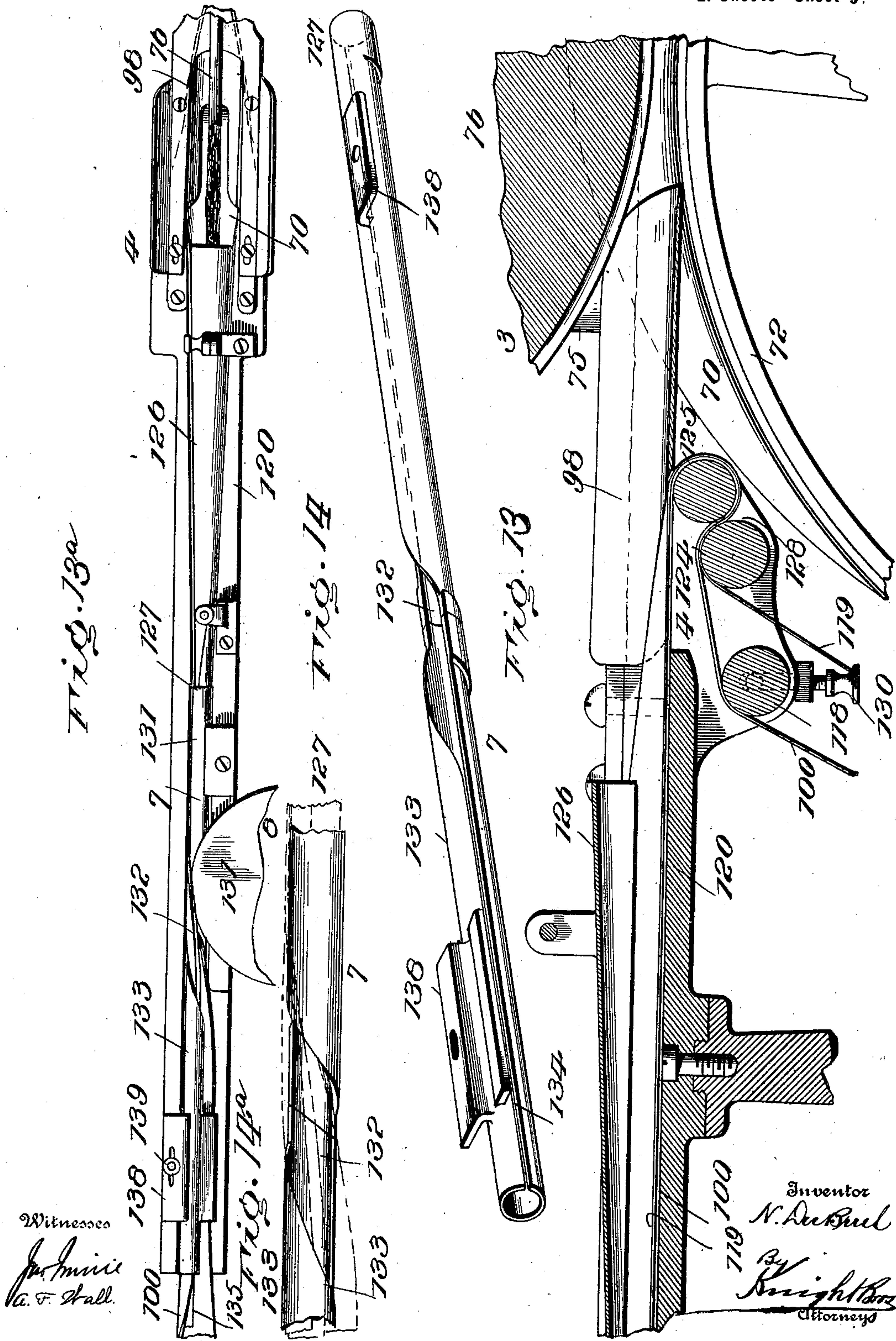
Attorneys

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 9.

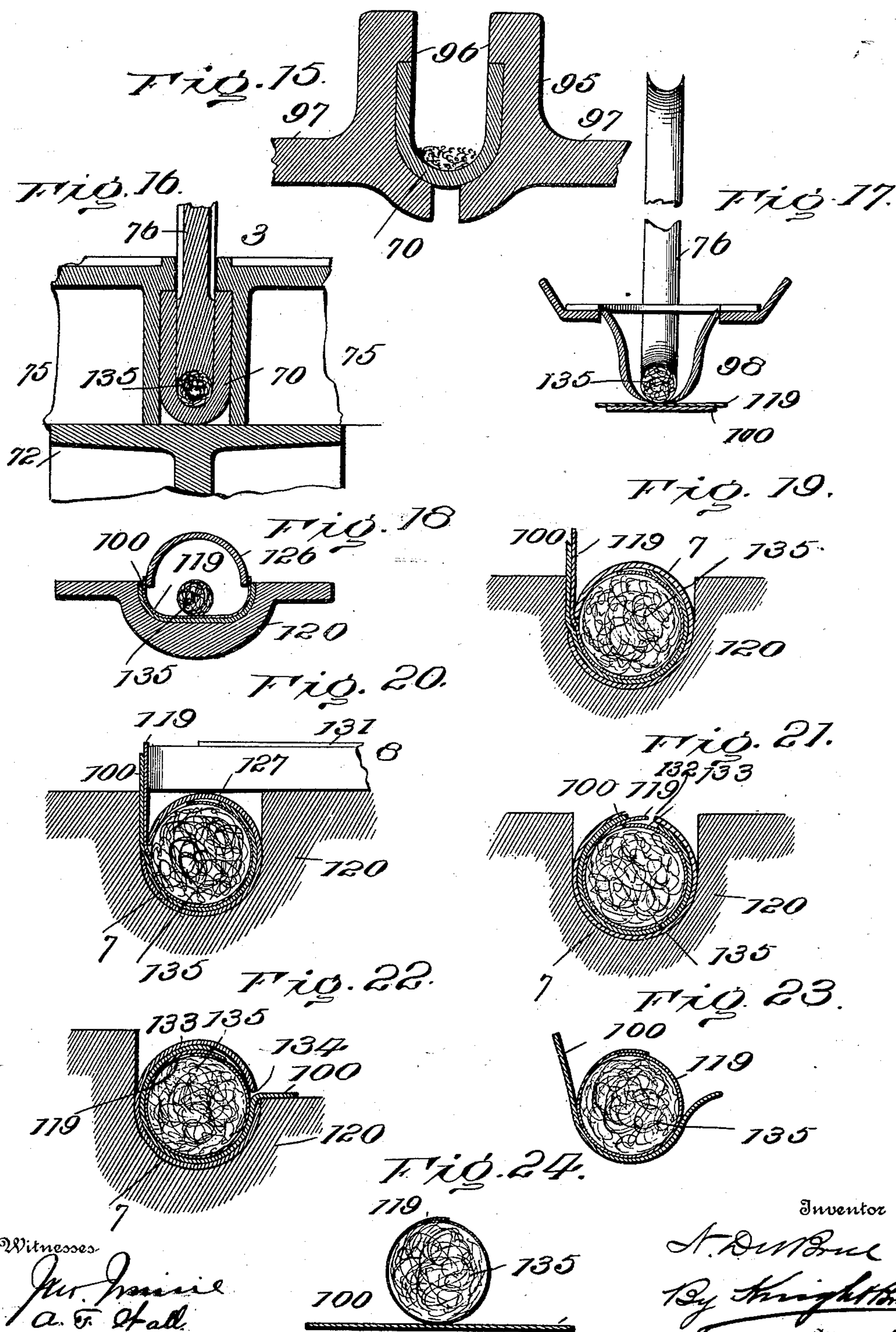


N. DU BRUL.
CIGARETTE MACHINE.

(No Model.)

(Application filed Apr. 3, 1900.)

21 Sheets—Sheet 10.



No. 671,417.

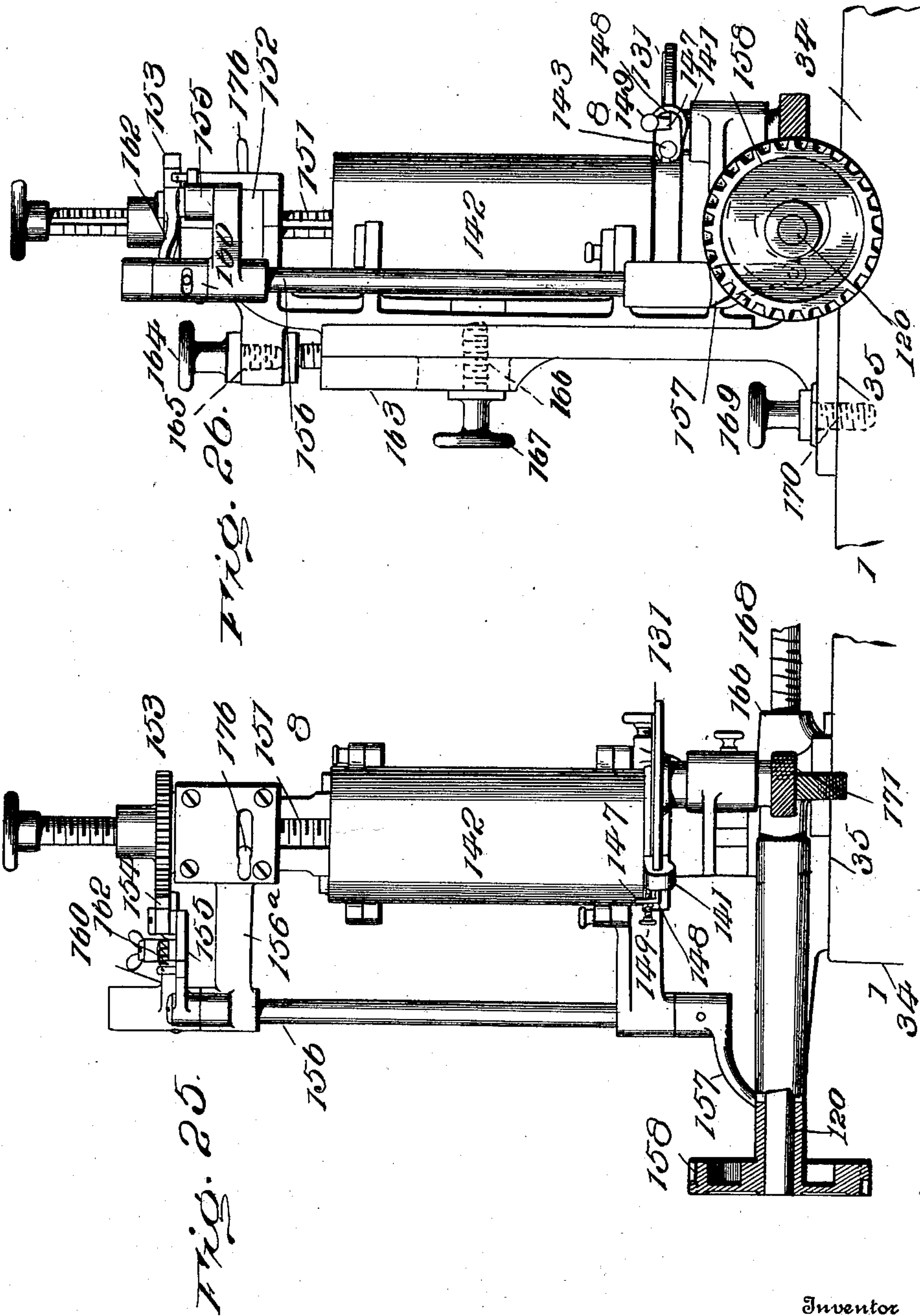
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet II.



Witnesses

Mr. Inice
a. F. Hall.

Inventor

N. Du Brul
By Knight
Attorneys

No. 671,417.

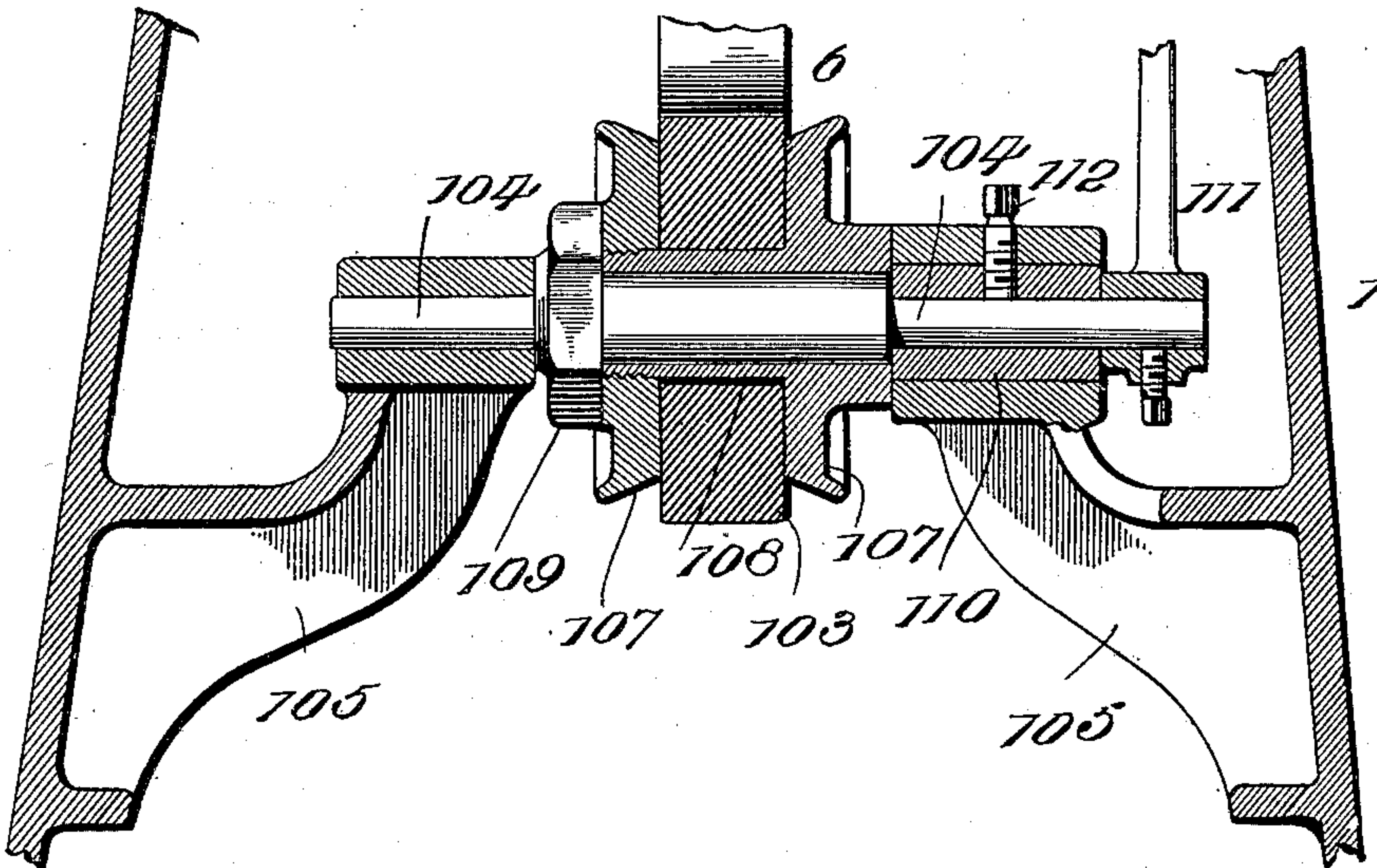
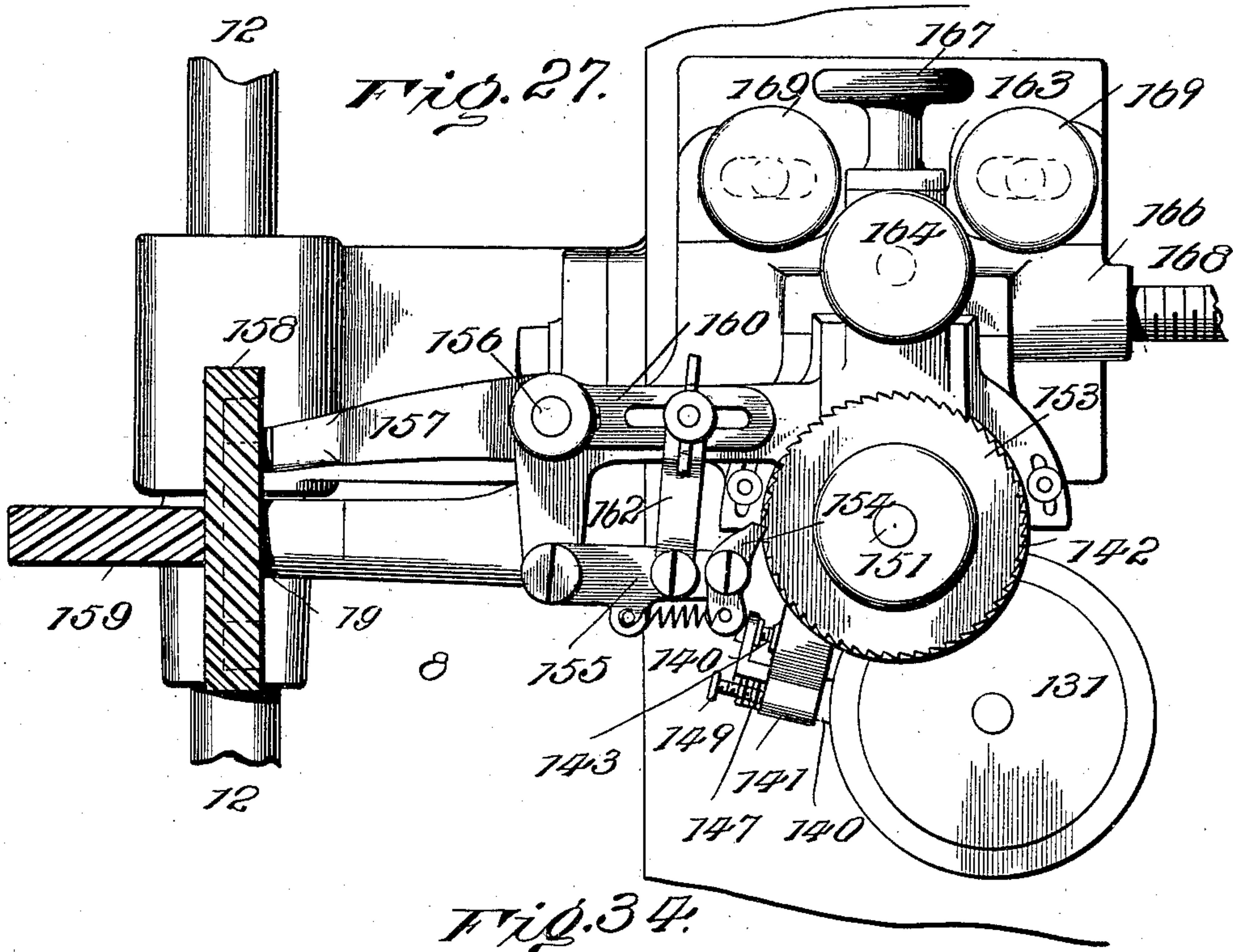
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 12.



Witnesses
Mr. Mire
A. F. Hall

Inventor
N. Du Brul
By Knight
Attorney

No. 671,417.

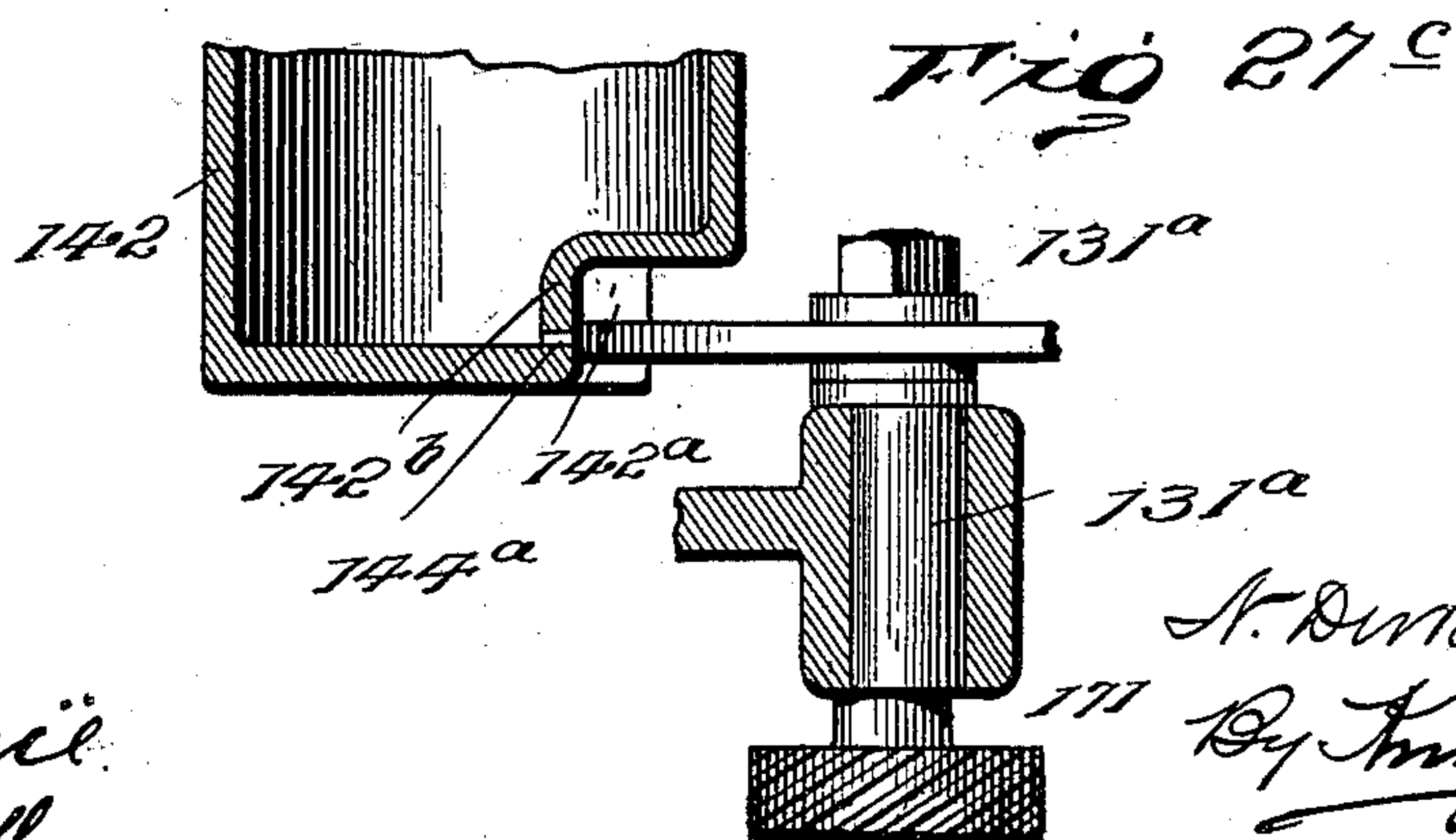
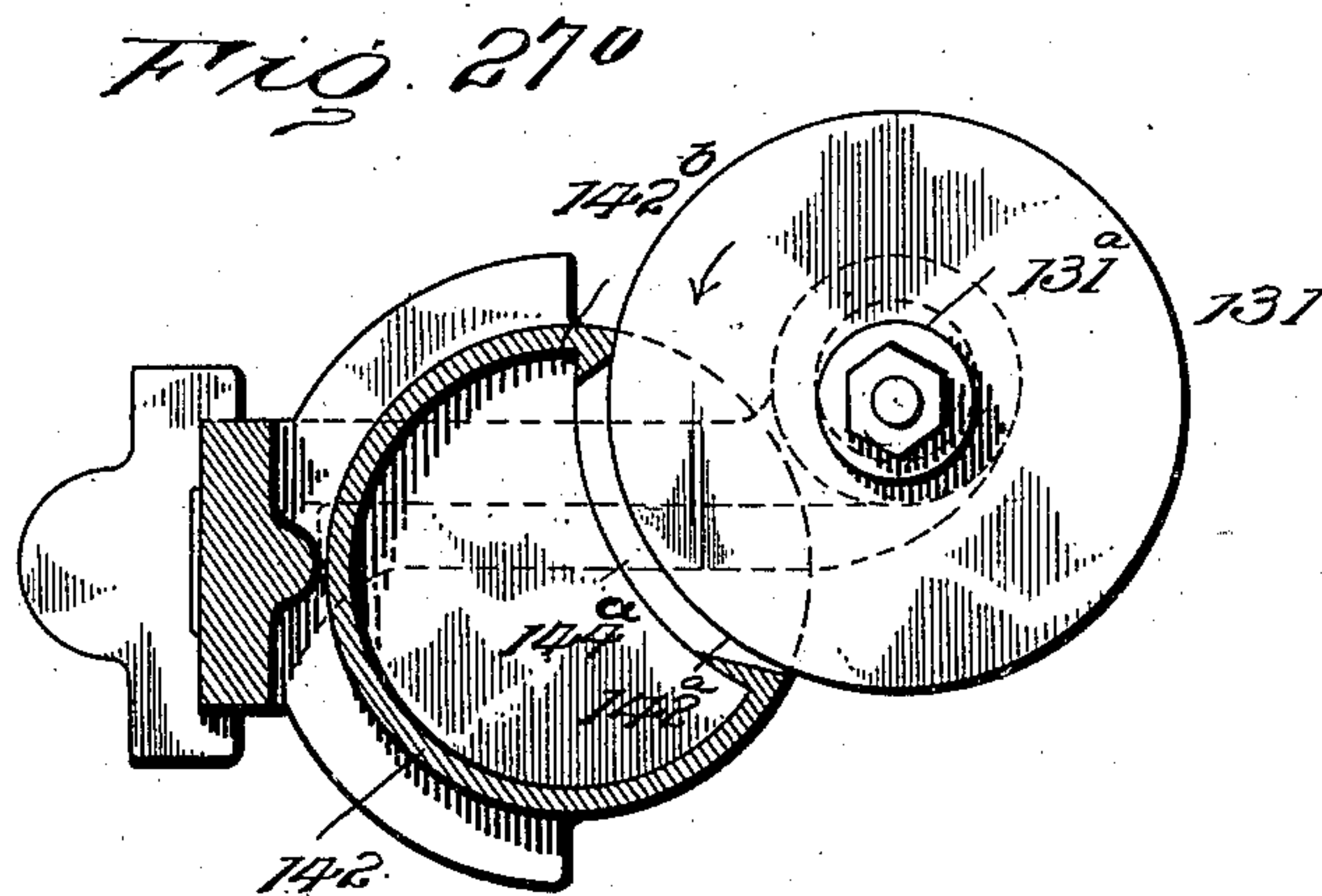
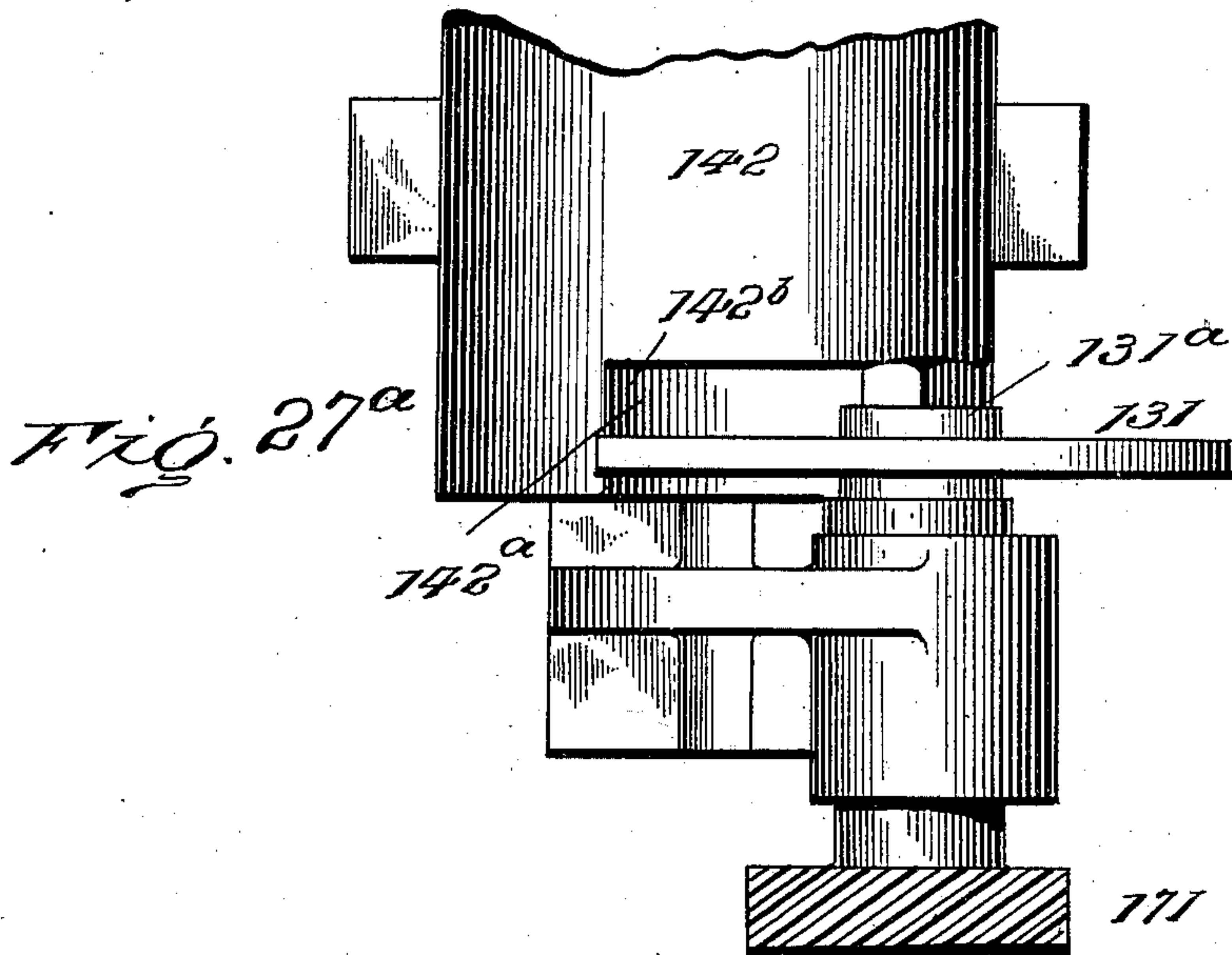
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(No Model.)

(Application filed Apr. 3, 1900.)

21 Sheets—Sheet 13.



Witnesses
Geo. M. Hall
A. F. Hall

Inventor
N. Du Brul
By *Knight Bros*
Attorneys

No. 671,417.

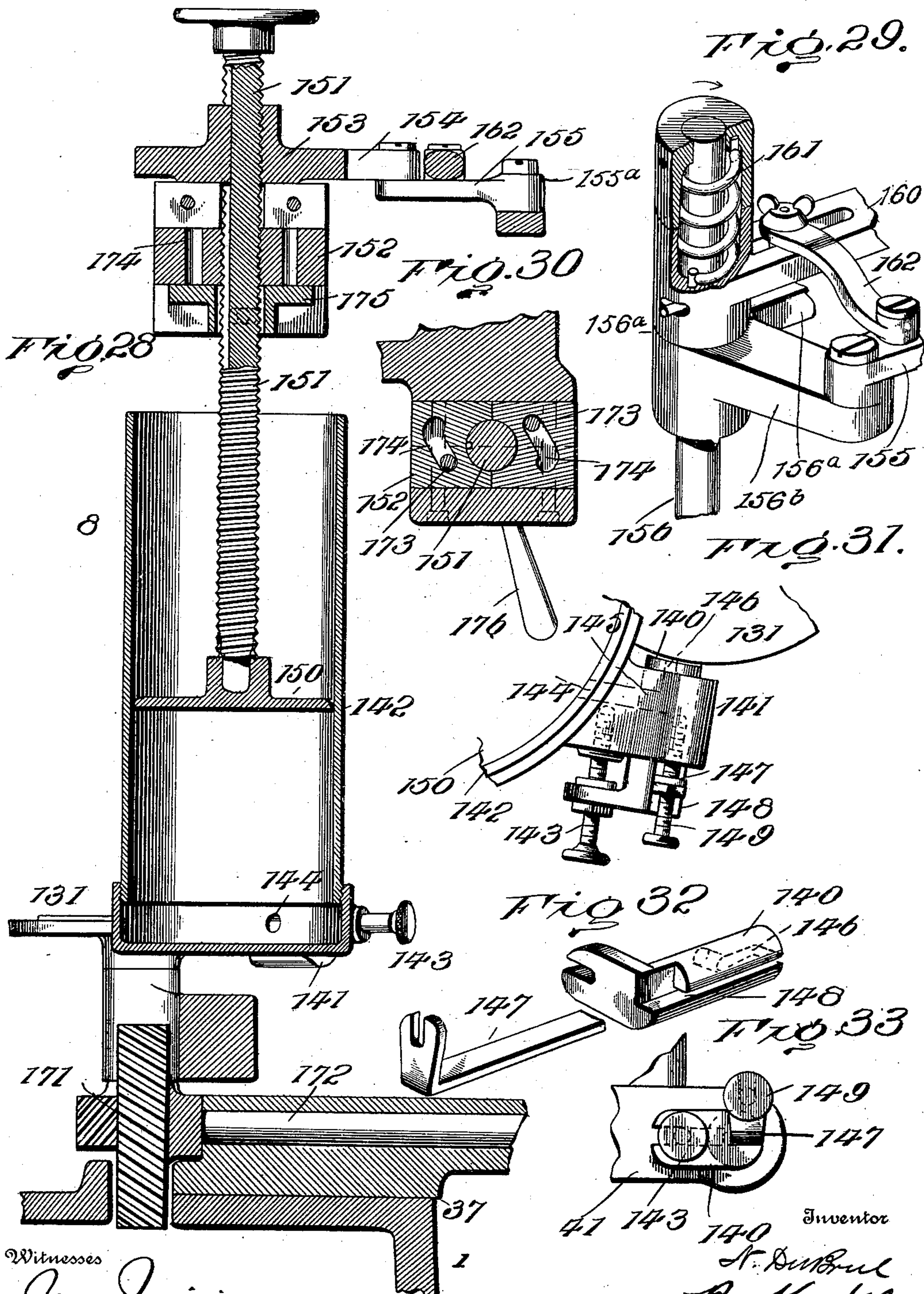
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 14.



Witnesses
John J. Smith
A. E. Hall

Inventor
N. Du Brul
By *Wm. H. Knight*
Attorney

No. 671,417.

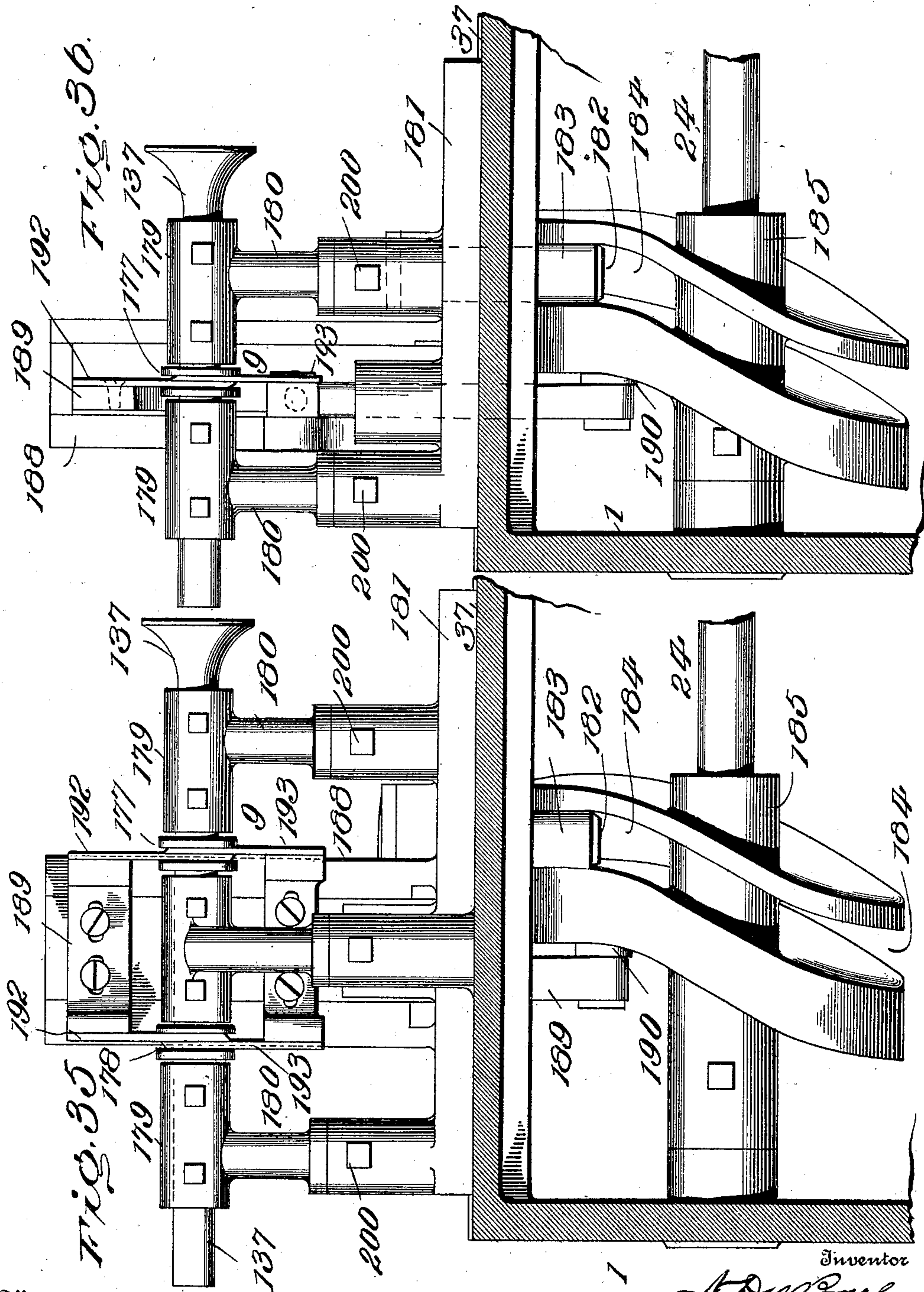
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 15.



Witnesses

J. M. Miller
A. F. Hall

Inventor

N. Du Brul
By Knight Bros
Attorneys

No. 671,417.

Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 17.

Fig. 41.

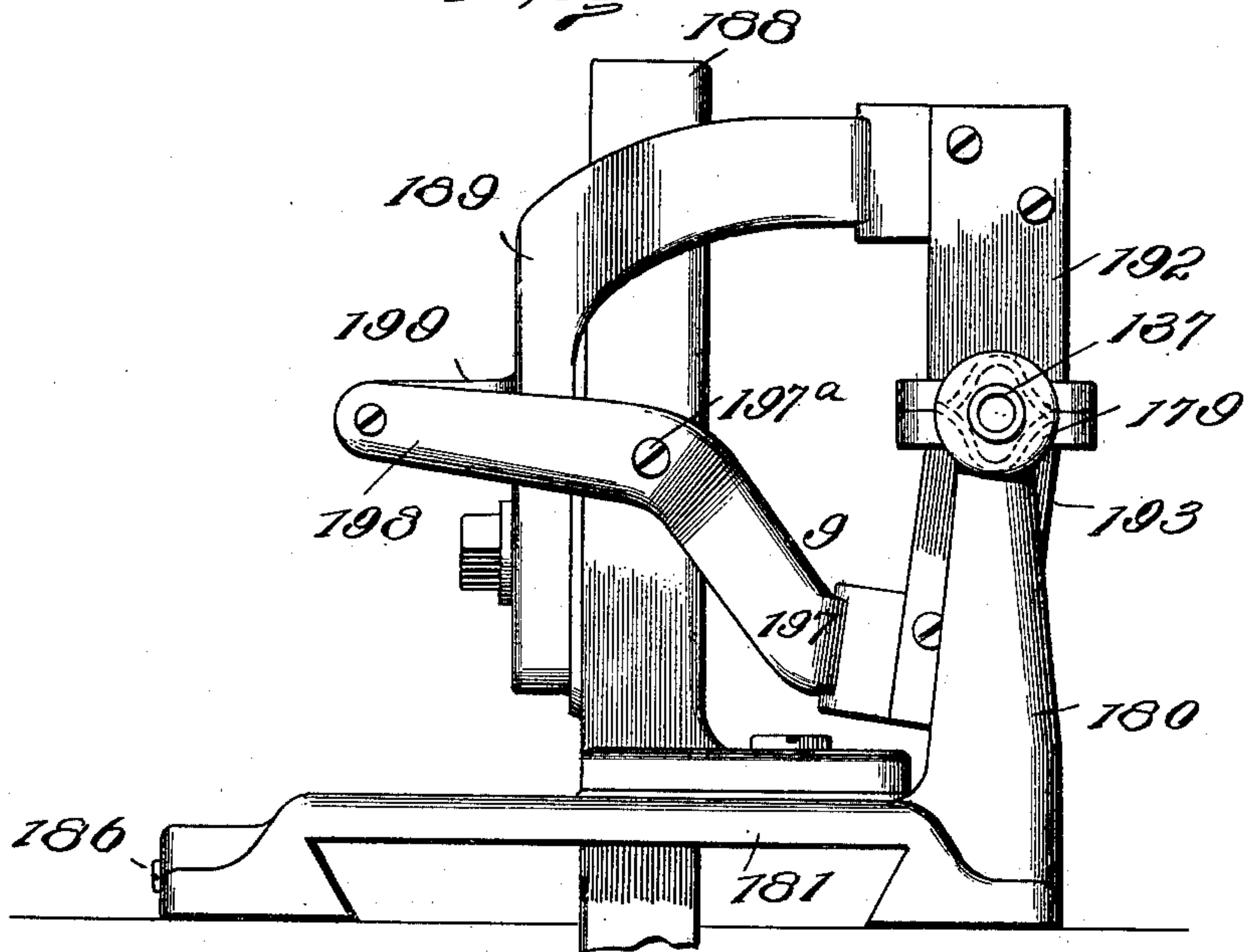
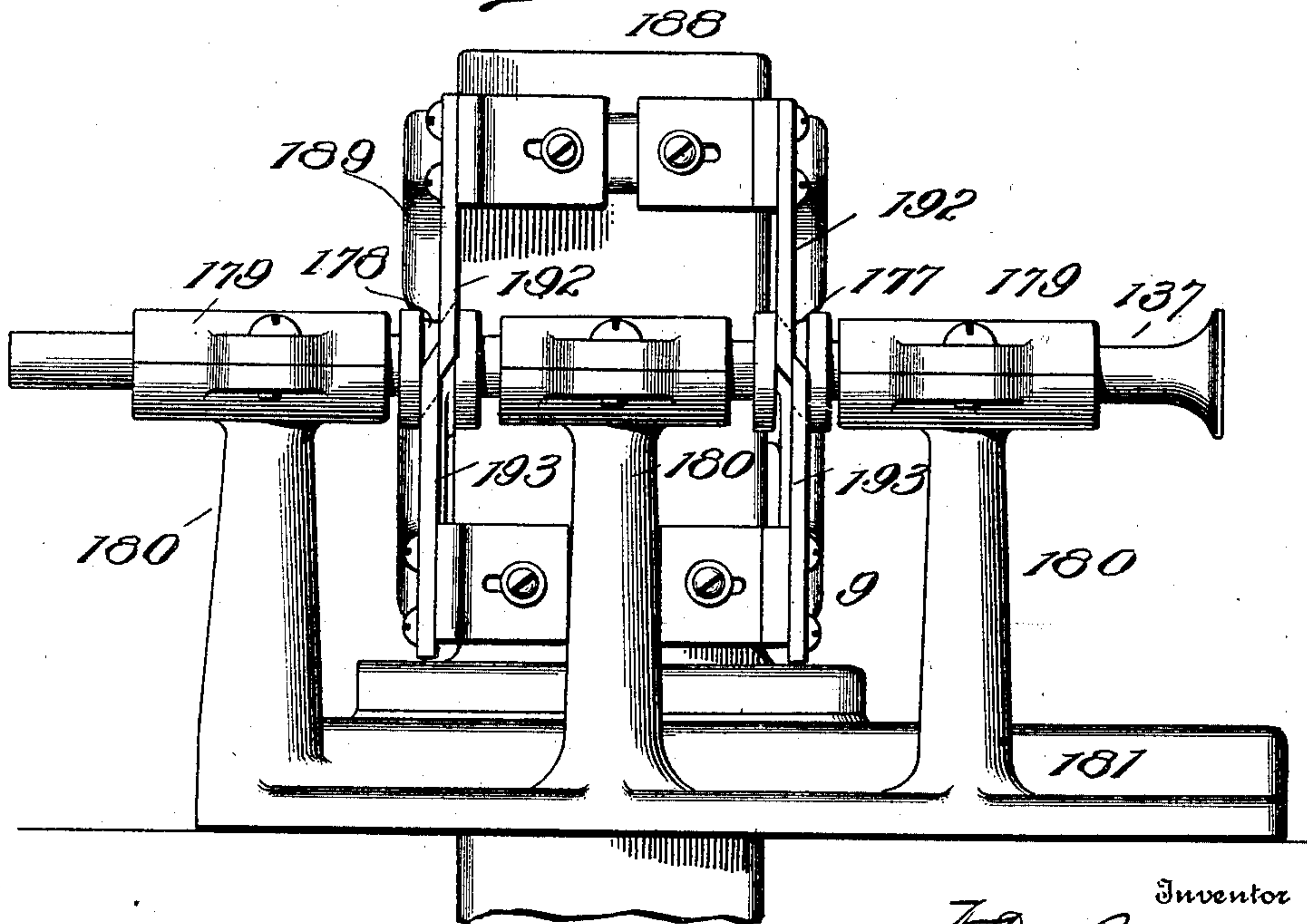


Fig. 42.



Witnesses

J. M. M. M. M.
a. f. Hall.

Inventor

N. Du Brul

R. Knight
Attorneys

No. 671,417.

Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(No Model.)

(Application filed Apr. 3, 1900.)

21 Sheets--Sheet 18.

Fig. 43

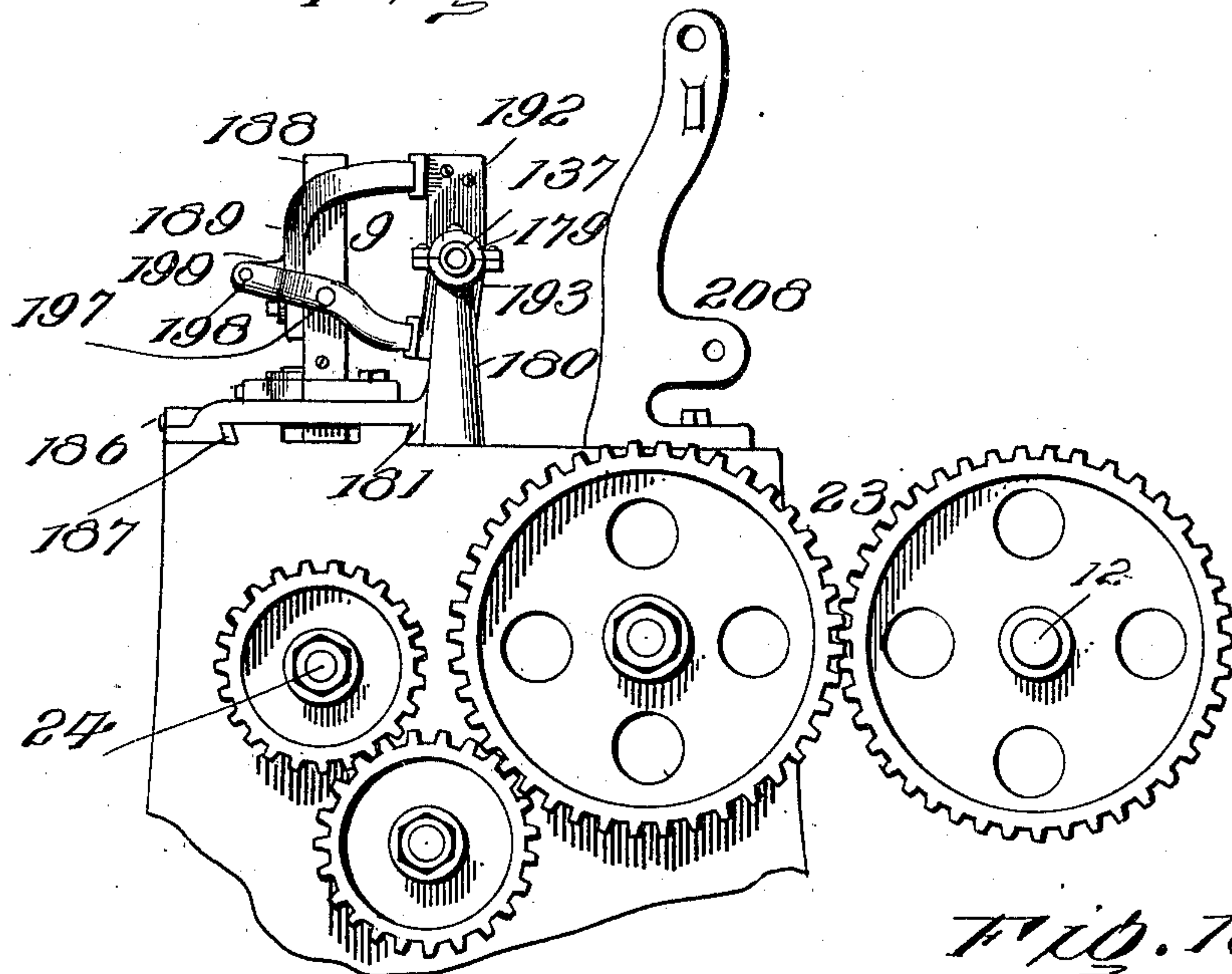


Fig. 130

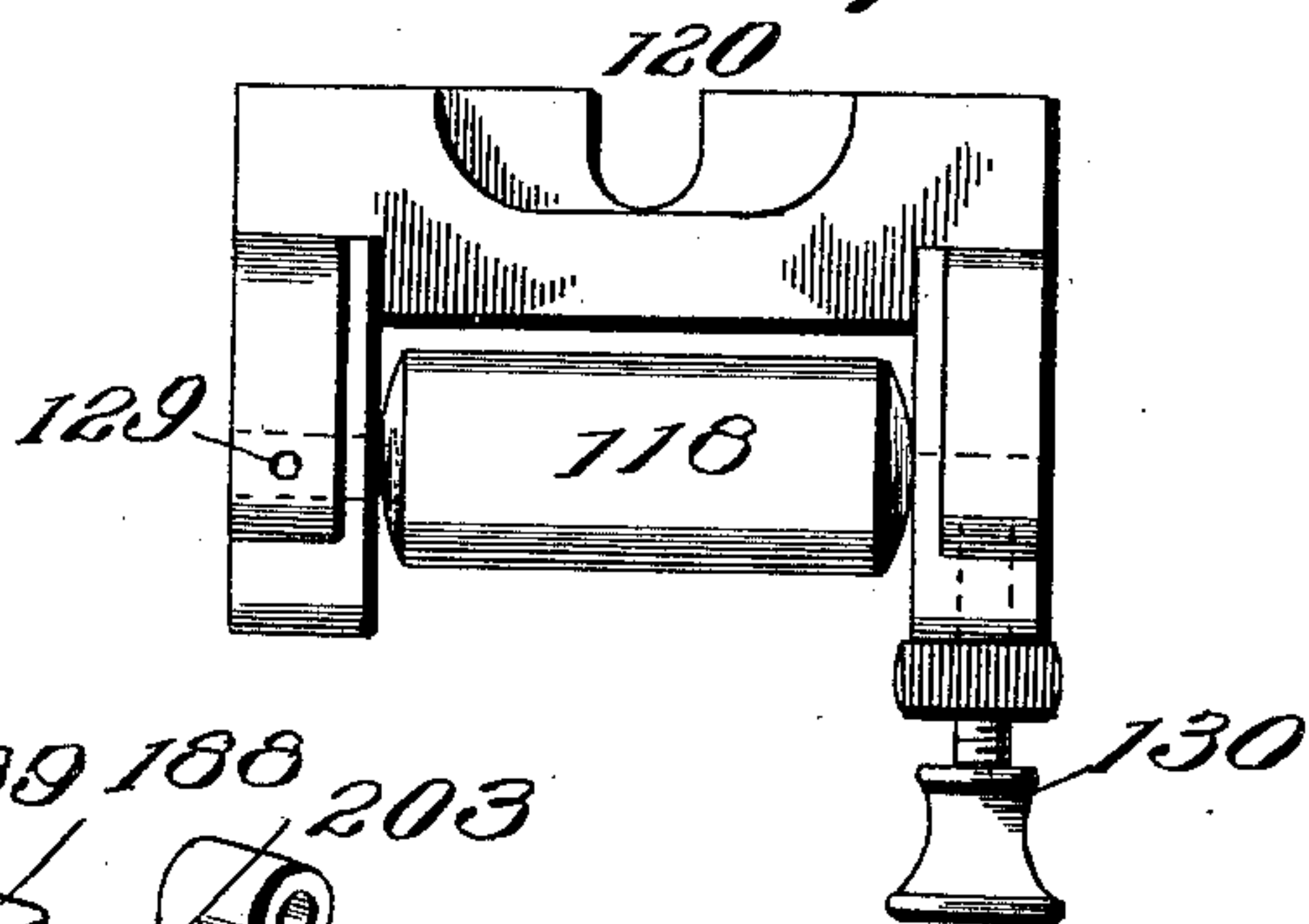
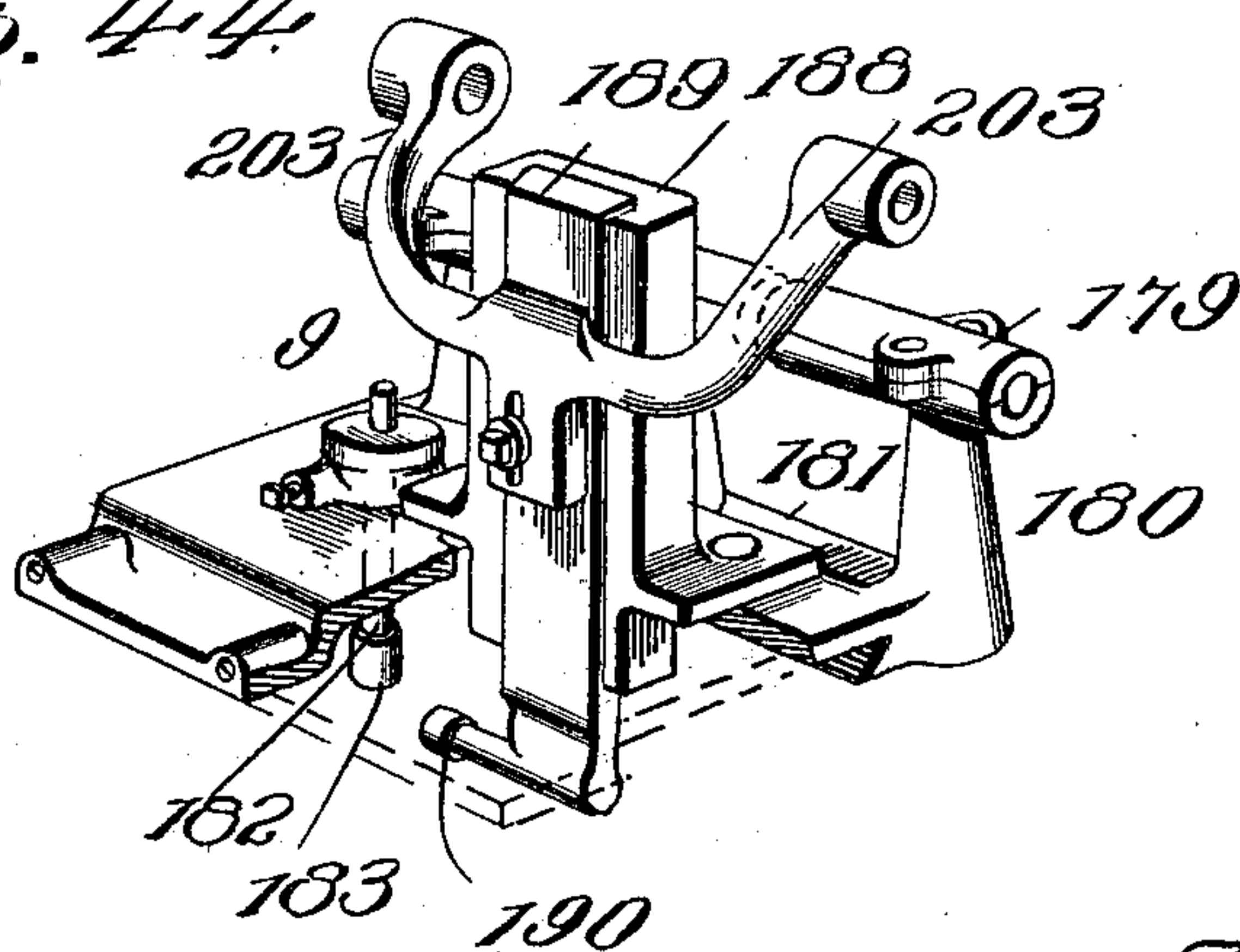


Fig. 44



Witnesses

J. M. Miller
a. f. Hall

Inventor

N. Du Brul
By Knight Bros
Attorneys

No. 671,417.

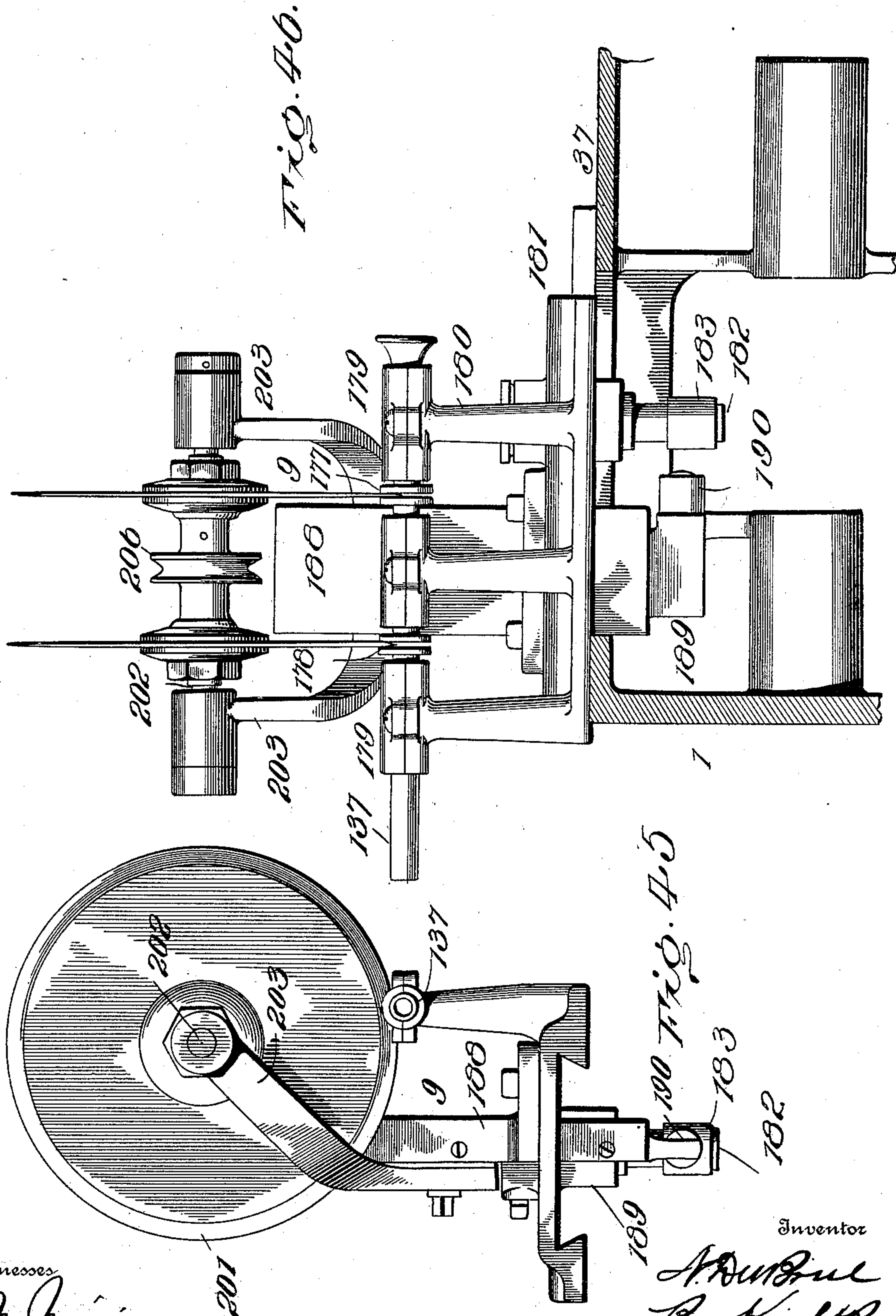
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets--Sheet 19.



Witnesses

J. M. Hall
A. F. Hall.

Inventor

N. Du Brul
By *Knights*
Attorney

No. 671,417.

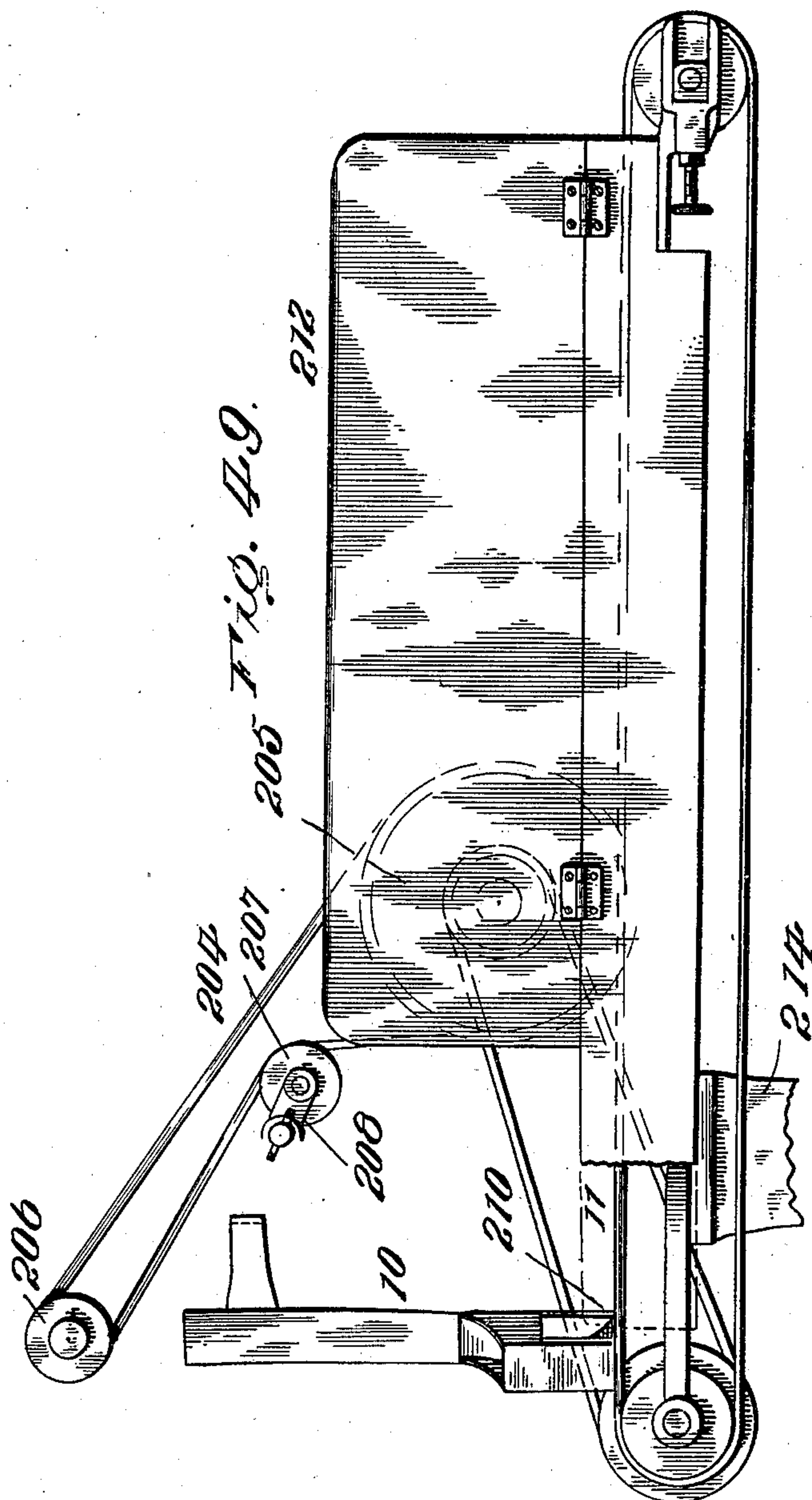
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(Application filed Apr. 3, 1900.)

(No Model.)

21 Sheets—Sheet 20.



Witnesses:
J. W. Irvine
A. T. Hall

Inventor
N. Du Brul
By *Wm. Knight*
Attorney

No. 671,417.

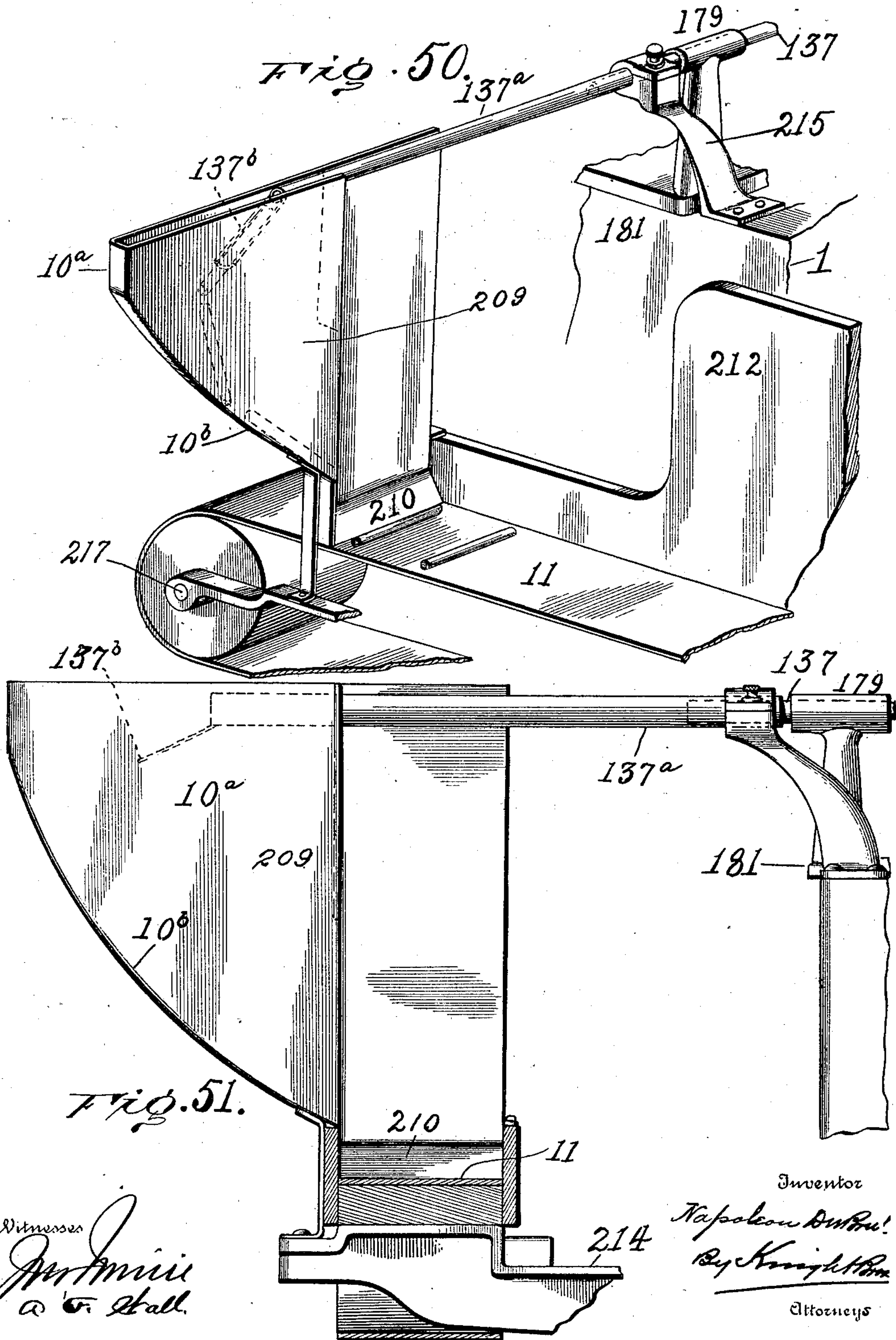
Patented Apr. 2, 1901.

N. DU BRUL.
CIGARETTE MACHINE.

(No Model.)

(Application filed Apr. 3, 1900.)

21 Sheets--Sheet 21.



UNITED STATES PATENT OFFICE.

NAPOLEON DU BRUL, OF CINCINNATI, OHIO.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 671,417, dated April 2, 1901.

Application filed April 3, 1900. Serial No. 11,389. (No model.)

To all whom it may concern:

Be it known that I, NAPOLEON DU BRUL, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Cigarette-Machines, of which the following is a specification.

This invention relates to improvements in machines for making cigarettes, and more particularly to that class of machines generally known as "continuous-cigarette machines," and has for its object to improve and simplify the general arrangement of the machine as a whole, as well as the several mechanisms or parts thereof which are employed in carrying out the several steps in producing the finished cigarettes and delivering them in orderly condition ready for introduction into the boxes. My invention therefore involves improvements in the main frame upon which all the mechanisms are mounted, in the tobacco feeding and dressing mechanism, in the tobacco-rope former, in the tape guiding and directing mechanism, in the wrapping-tube, in the pasting device, in the cutter or severing device, in the discharger, and in the conveyer. The novel features of construction of these several mechanisms or parts will be first fully described *seriatim*, and then particularly pointed out in the subjoined claims, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of the entire machine. Figs. 2 and 3 are respectively a plan and a side view thereof. Fig. 3^a is a detail view of a crank-arm carrying a roller through which tension is applied to the tape. Figs. 4 and 5 are respectively a front end elevation of and a vertical transverse section through the tobacco feeding and dressing mechanism. Fig. 6 is a vertical transverse section through a part of the rope-former. Figs. 7 and 8 are respectively a plan and a side elevation of the preferred form of the rope-former, drawn on an enlarged scale. Figs. 9, 9^a, and 9^b are respectively a side view, an end view, and a sectional detail of the tightener and cleaner for the tobacco-rope belt. Fig. 10 is a detail view of the stripping and bridging plate that strips the rope from the forming-belt and conducts it to the wrap-

ping-tube. Figs. 11 and 12 are respectively a plan and a side elevation of the rear end of the rope-former and condensing-wheel for delivering the formed rope in proper condition to the wrapper-paper. Fig. 13 is a vertical longitudinal section, on an enlarged scale, of the parts that receive the formed tobacco rope and direct it to the wrapper-forming paper. Fig. 13^a is a plan of the same, on a reduced scale, together with the wrapping mechanism. Fig. 13^b, Sheet 18, is a detail view of a tape-shifting device by means of which the tape, and through it the paper, may be shifted laterally to regulate the line of feed and present the edge of the paper in proper position for the paster. Fig. 14 is a detail perspective of the two-part wrapping-tube. Fig. 14^a is an enlarged detail view of the cross-over in the paper-slot of the wrapping-tube. Figs. 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24 are vertical transverse sections taken at various places in the tobacco's course after the deposit of the tobacco upon the rope-forming belt and up to the issue of the completed cigarette-rod from the wrapping-tube and illustrating progressively the several stages in the development of the cigarette. Figs. 25, 26, and 27 are respectively a rear view, a side view, and a plan of the paste-supplying mechanism. Figs. 27^a, 27^b, and 27^c are detail views in elevation, horizontal section, and vertical section, respectively, showing the preferred form of paste-discharging means. Fig. 28 is a vertical section of the same, taken in a plane parallel to the plane of Fig. 25 and showing a modified form of paste-discharge-regulating means. Fig. 29 is a sectional detail perspective of the automatic tension-relief interposed in the rotating mechanism for the paste-exPELLING plunger-screw. Fig. 30 is a sectional view of the releasable-nut for the feed-screw. Figs. 31, 32, and 33 are detail views of a valve forming part of the modified form of means for regulating the feeding of paste to the applying-wheel. Fig. 34, Sheet 12, is a sectional view showing the construction of and the eccentric adjustment for the pressure-wheel of the tape-driving pulley. Figs. 35 and 36 are views illustrating the double and single forms of one type of cutter for severing the cigarettes from the continuous cigarette-rod, also the compound cam which horizontally recip-

5 rocates the cutter bodily commensurately
 with the feed of the cigarette-rod during the
 severing operation and simultaneously im-
 parts vertical cutting movement to the sever-
 ing-blades. Figs. 37 and 38 show by face and
 sectional views the preferred mode of sever-
 ing the cigarettes—that is to say, by means
 of a pair of crimping and cutting blades. Figs.
 39 and 40 illustrate by rear view and plan one
 10 construction employed for imparting the op-
 posite relative movements to the severing and
 crimping blades. Figs. 41 and 42 are rear
 and side elevations of the preferred construc-
 tion of means for imparting the opposite
 15 movements to the crimping and severing
 blades. Fig. 43 is an elevation of the driving
 connections at the rear end of the machine.
 Fig. 44 is a perspective view of the mounting
 for a type of severing device operating upon
 20 the principle of a rotary cutting-disk and
 which is adapted to receive vertical and hori-
 zontal reciprocation from the compound cam
 already referred to. Figs. 45 and 46 are re-
 spectively a rear and a side view of the type
 25 of severing device referred to in Fig. 44. Fig.
 47, Sheet 7, is a longitudinal section of the
 severing-tube. Fig. 48, Sheet 7, is a perspec-
 tive view of the discharge-chute. Fig. 49 is
 a rear end elevation of the conveyer and
 30 stacker. Figs. 50 and 51 represent, by a per-
 spective and side elevation, a construction of
 a preferred modification of the conveyer and
 stacker.

35 The general arrangement, which will be re-
 ferred to before proceeding to a detailed
 description of the several mechanisms, will
 be understood upon reference to Figs. 1, 2,
 and 3, wherein 1, represents the main frame;
 2, the tobacco feeding and dressing device;
 40 3, the tobacco-rope former; 4, the tape guid-
 ing and directing mechanism; 5, the paper-
 roll holder; 6, the tape-driving wheel; 7, the
 wrapping-tube; 8, the pasting device; 9, the
 severing device; 10, the discharger, and 11
 45 the conveyer. 12 represents the main shaft,
 supported in bearings 13 along one side of
 the machine, and which may be driven from
 any suitable source of power, as suggested by
 pulley 14. The said shaft 12 has driving
 50 connection 15 with the shaft 16 of the tobacco
 feeding and dressing mechanism, also driv-
 ing connection 17 with the shaft 18 of the to-
 bacco-rope-forming mechanism, driving-gear
 19 for the shaft 20 of the pasting device, driv-
 ing connection 21 for the shaft 22 of the tape-
 55 driving wheel, driving connection 23 for the
 shaft 24 of the severing device, and driving
 connections 25 for the conveyer. The shaft
 12 is divided by the clutch 26, the moving
 60 member of which is controlled by a crank-
 yoke 27 on a shaft 28, extending transversely
 through the machine and manipulated by a
 crank 29 on its opposite end. By this means
 the working parts driven by that portion of
 65 the shaft beyond the clutch 26 may be stopped
 independently of the movement of the front
 end of the driving-shaft which operates the

mechanism up to and including that which
 forms the rope. The connection 21 may be
 thrown in and out by a similar crank-yoke 70
 30 on a shaft 31, that likewise extends through
 the machine and is controlled by a handle 32
 upon its opposite end, by which means the
 tape-driving wheel may be arrested independ-
 75 ently of the remaining mechanisms. 33 rep-
 represents a hand-wheel on the rear part of the
 shaft 12, by means of which that portion of
 said shaft may be rotated by hand in adjust-
 ing parts which are made independently mov-
 80 able through the medium of the disconnect-
 ing means just described.

I will now refer to the several parts or mech-
 anisms of the machine in detail.

The frame comprises the sides 34, formed
 with offsets 35, so as to divide the table formed 8;
 by the frame into an upper table 36 and a
 lower table 37. The frame is likewise pro-
 vided with end uprights 38 and intermediate
 uprights 39, connected by the lower horizontal
 supporting and bracing members 40. The 90
 entire frame is preferably formed of an in-
 tegral casting, and all of its parts are formed
 with inwardly-presented flanges. As shown
 in Figs. 1, 2, and 4, the top flanges of the sides
 of the frame are continued inwardly to form 95
 the upper and lower tables 36 and 37 for sup-
 porting the mechanisms mounted thereon,
 said tables being slotted or perforated at suit-
 able points to permit the passage of the
 rope-forming belt and the tape and paper 100
 through them. The rear end of the table is
 formed with the curved bracket 38^a, integrally
 connected at its respective ends with the up-
 right and horizontal members of the frame
 and providing one of the bearings for the 105
 shaft 24 of the severing-device cam, which
 shaft finds its outer bearing in the said up-
 right.

The tobacco feeding and pressing mechan- 110
 ism, as illustrated in Figs. 1 to 5, comprises
 an endless feed-apron 41, mounted in a trough
 42, which projects from the casing 43 of the
 mechanism, said apron passing around a
 drive-roll 44 within the casing, and a guid-
 ing and stretching roll 45 at the rear end of 115
 the trough. The roll 45 is mounted in bear-
 ings 46, located in slots 47 at the outer ends
 of the brackets 48, which support the feed-
 trough, and said roll is adjustable by a tight-
 ening-screw 49 and two fixing-screws 50. To- 120
 bacco deposited upon the apron 41 is carried
 forward beneath a feed-roller 51, by which it
 is matted and condensed in a uniform layer.
 The roll 51 is journaled slightly in rear of
 the vertical line of the axis of the driving- 125
 roll 44 and above a depression 41^b in the bot-
 tom board 41^a, so that said roll 51 is verti-
 cally above a yielding portion of the apron,
 and yet close enough to press the tobacco
 against the plate over the roll 44. The ob- 130
 ject of this arrangement is to permit the parts
 to obtain a better bight upon the tobacco and
 feed the compressed layer with greater uni-
 formity and more certainty. Located slightly

beneath, but tangential to, the apron 41 as it passes around its driving-roll 44 is a carrying-pin roll 52, upon which tobacco is pressed by the apron 41 in a uniform layer. 53 is a guide-roll located opposite the discharge end of the apron for the purpose of directing downward upon the pin-roll 52 any tobacco that would tend to pass beyond the latter. 54 represents a concave extending up to the apron 41 and conforming to the periphery of the pin-roll 52 for the purpose of preventing the tobacco from escaping from the latter. 55 is a stripper-roll the pins of which intermesh with the pins of the pin-roll 52 just beyond the lower end of the concave 54. The several rolls revolve in the directions indicated by the arrows by means which will be described, the speed of the stripper-roll 55 being much more rapid than that of the pin-roll 52, and the result of the particular locations and relations of the rolls is such that the tobacco is fed constantly by the feed-apron 41 upon and caused to adhere to the pin-roll 52, is carried down in a constant uniform layer by said pin-roll 52, and is stripped from the pin-roll 52 and deposited in thoroughly-segregated particles into the hopper 56 by means of the stripper-roll 55. I have found in practice that by the specified arrangement and relation of parts the feeding and dressing of the tobacco are satisfactorily accomplished, and a great deal of complication heretofore employed for performing this part of the operation is done away with.

As shown in Fig. 4, the several rolls of the tobacco feeding and dressing mechanism are driven by the following connections: The shaft 16, which is driven through the bevel-gear 15 from the main shaft 12 of the machine, terminates in a worm 57, meshing with the large wheel 58, which is on the shaft 59 of the pin-roll 52, which shaft also carries a gear-wheel 60, intermeshing with the double-face gear-wheel 61 on the driving-roll 44 of the apron 41, which gear-wheel 61, by reason of the double width of its face, intermeshes with and drives both the gear-wheel 62 on the guide-roll 53 and the gear-wheel 63 on the feed-roll 51. These connections impart to the rolls 44, 51, 52, and 53 substantially equal surface movement; but the stripper-roll 55 receives a very much more rapid movement through the medium of its gear-wheel 64, which intermeshes with the multiplying-wheel 65, which in turn is connected, through bevel-gear 66, with the shaft 16.

The tobacco-rope-forming mechanism.—An endless leather or equivalent belt 70 travels beneath hopper 56 of the feeding and dressing mechanism, as shown more clearly in Fig. 5, and, as shown in Figs. 1, 2, and 3, passes around a driving-wheel 72 and guide-wheel 73. In the simplest form (shown in Figs. 1, 2, and 3) final shape is given to the rope by a single pair of shaping-wheels 75, pressing the belt 70 upon the sides of a single grooved presser-wheel 76, which is approximately the

thickness of the rope to be formed, as shown in Figs. 6 and 16, and by this shaping of the belt at this point and the stretching of the belt around the wheels 72 and 73 said belt takes a shape tapering from a narrow former at the point of contact with the presser-wheel, as shown in said Figs. 6 and 16, to a shallow concave at the point vertically beneath the hopper 56, as shown in Fig. 5. The shape at an intermediate point is shown in Fig. 15; but I prefer to employ the arrangement shown in Figs. 7 and 8, wherein I employ not only the shaping-wheels 75 and presser-wheel 76, but also arrange in advance of said wheels an additional pair of shaping-wheels 75^a to press the belt upon a preliminary presser-wheel 76^a, which has a broader peripheral groove than the wheel 76 and gives a preliminary shaping to the rope, while the wheels 75 and 76 cooperate with the belt to give a final condensation to the shaped rope. This forms a conveyor which readily receives the properly-dressed tobacco and carries it forward, gradually condensing it in width until it reaches the presser-wheel 76^a, which with its concave periphery completes a former that gives the desired shape to the tobacco rope, after which the formed rope passes to the condensing-wheel 76. It should be noted in connection with this former that at no time does the tobacco contact with any part other than the belt until it reaches the presser-wheels 76^a and 76, and as the latter necessarily move at the same speed as the belt no part of the tobacco is retarded or interfered with and the formed rope emerges from the former in perfect condition. It will also be observed that by the nature of the belt, a leather belt being preferably used, the lower portion of the former provided by the belt is naturally rounding and gives the proper shape to the rope. As shown in Figs. 3, 9, 9^a, and 9^b, the belt may be tightened at will through the medium of a deflecting-wheel 77, mounted in a frame 78, swinging about the axis 18 of the drive-wheel 72, said frame being adjustable through the medium of a set-screw 80, threaded in a fixed bracket 81 and impinging a lug 82 on the swinging frame 78, said screw being provided with a lock-nut 83. A cleaning-brush 84, Figs. 9^a and 9^b, is also mounted in said frame 78 and adapted to be adjusted against the drive-wheel 72 by its eccentrically-trunnioned axis 85. It is geared to the deflecting-wheel and is rotated by the latter in the direction opposite to the travel of the belt, so that the belt is brushed and kept clean. This form of belt-tightener not only drives the cleaning-brush, but offers a very convenient means for putting the required tension on the belt 70 to insure proper operation and also makes it quite convenient to relieve the belt of tension when the machine is shut down for any length of time.

The rope-forming mechanism is further provided with means whereby the size of the rope to be formed may be regulated at will. To

accomplish this, the presser-wheels 76 and 76^a are made vertically adjustable by forming their axles with trunnions 86 eccentric thereto and having squared heads 87 by which to turn the said trunnions. As clearly shown in Figs. 6, 7, and 8, the turning of the axles upon their trunnions causes the wheels 76 76^a to move vertically. To fix the adjustment of said wheels, one of the trunnion-bearings 88 of each axle 86 is split and provided with a clamp-screw 89. The belt-forming wheels 75 75^a are horizontally adjustable in a similar manner through the medium of eccentric trunnions 90, provided with turning-heads 91, and mounted in split bearings 92, having clamp-screws 93. By these means the impingement of the wheels 75 75^a upon the belt 70 and the impingement of said belt on the presser-wheels 76 or 76^a may be regulated and said presser-wheels 76 and 76^a relieved of such lateral impingement temporarily when it is desired to adjust either of them vertically.

As seen in Figs. 1, 2, and 3, the belt 70 travels above the upper table 36 to a point beyond the offset 35, where the drive-wheel 72 extends through the lower table 37 to the level of the upper table and supports the belt at the point where the wheel 76 coöperates with the belt to complete the shape of the rope. A further advantage in the offset 35 is that it provides a free space for mounting the wheels 75 and 76, for which latter purpose I employ a specially-formed bifurcated bracket 94, in the arms of which are formed the bearings for said wheels 75 75^a 76 76^a, said bracket being mounted, as shown, upon the end of the upper table 36.

In order to prevent tobacco falling beyond the edges of the belt 72, I provide side guards 95, Figs. 1, 2, 5, and 15, made to conform to the shape which the belt takes and having overlapping lips 96, beneath which the edge of the belt works. Said guards 95 are further provided with attaching-flanges 97, projecting laterally above their lower edges, so that the latter rest in the longitudinal slot in the table 36, along which the belt travels.

98, Figs. 1, 2, 10, 12, and 13, represents a stripping and bridging plate of concave form, which enters the opening groove of the belt as it spreads beyond the forming-wheel 75, and receiving the formed rope directs it in its passage to the paper, which enters, with the tape, the feed-line of the machine at a point beneath the slotted rear end 98^a of said plate 98. The forward end of the plate 98 scrapes the belt, as shown in Fig. 12, and though formed to prevent undue abrasion prevents any possibility of adhesion between the tobacco and the belt beyond this point.

As shown in Figs. 11 and 12, I prefer to mount a third presser-wheel 76^b in front of wheel 76 and driven from the latter through gear-wheel 76^m, idler 76ⁿ, and gear-wheel 76^o, said idler being supported by toggle-links 76^h, pivoted upon the axes of wheels 76 and 76^b. Wheel 76^b serves as an additional pressure-

wheel and is adjustable vertically by means of an eccentric axle similar to that described for wheel 76. Adjustment of wheels 76 76^b will not impair their driving connections, owing to the toggle-links which carry the idler. It is necessary with some classes or conditions of tobacco to apply additional pressure or condensation to the rope at this point. This wheel 76^b affords very simple means for accomplishing this purpose, since it derives its power from wheel 76, and since the latter is driven by contact of the forming-belt it follows that the wheel 76^b will travel uniformly with the belt.

The tape and paper guiding and directing mechanism will be understood upon reference to Figs. 1, 3, and 12. The tape 100, which is in the form of an endless band, passes around its drive-wheel 6, whose shaft 22 is rotated by the gear 21, Fig. 1, driving connection of the tape with the wheel 6 being insured by the pressure-wheel 103, Figs. 1, 3, and 34, adjustable to and from said drive-wheel through the medium of the eccentric journals 104, mounted in brackets 105. As shown in Fig. 34, the intermediate portion of the wheel 103 is of leather or some similar soft material and is mounted between flanges 107, one of which has an integrally-formed sleeve 108, upon which the central portion of the wheel and flange 107 fit, the parts being secured together by nut 109, threaded upon said sleeve 108. In order that the pressure-wheel 103 may be removed from its brackets 105, one bearing is provided with a bushing 110, removable from the bearing with the eccentric axle of the pressure-wheel. Turning of the axle for adjustment of the wheel is accomplished through the lever 111, and the adjustment is maintained by a set-screw 112. From its driving-wheel 6 the tape passes over a tightening-roller 113, Fig. 3^a, mounted in a crank-arm 114, which has a swinging bearing-stud 115, fitted in the frame for the purpose of regulating the extension upon the tape, the crank-arm 114 being held at any angle to which it may be adjusted by means of a milled head 116, threaded upon the protruding end of its bearing-stud 115. From the tension-roller 113 the tape passes beneath the guide-roller 117, suitably mounted on the frame, and thence over a guide-roller 118, Fig. 13. A tape-guide 117^a, pivotally mounted on bracket 117^b, Fig. 12, is preferably introduced before the roller 118. Referring now to Fig. 13, it will be seen that the paper 119 passes from the roll-holder 5, journaled on an axis 121 in a bracket 122, to a slotted plate 123, that holds it away from the tobacco-belt, thence to a point where it meets the tape, after which the tape and paper pass together over roller 124, under roller 125, then beneath the slotted bottom of the stripping and bridging plate 98, where, as seen from Figs. 13 and 17, they first meet the tobacco rope, and then enter the wrapping-trough 120, passing beneath the guard 126, (see Figs. 13, 13^a, and 18,) where they are

gradually rounded upward from the form shown in Fig. 18 at the commencement of said guard to the form shown in Fig. 19 at the end of said guard, with one edge of the paper projecting when they enter the wrapping-tube 7, to be described. From the roller 124 contact between the tape and paper is such that the movement imparted to the tape by its driving-wheel 6 carries the paper with the tape and causes the former to follow the latter. The rollers 118, 124, and 125 are mounted in a bracket 128. In order to cause the tape to travel in the proper line through the parts which form the paper tube, one journal of the roller 118 rocks upon a pin 129, while the opposite journal of said roller is adjusted in a slot in one direction by a set-screw 130, the roller being held in the other direction by the tension of the tape passing over it. By thus shifting the angle of the roller 118 the tape may be made to shift slightly to either side and the line in which it travels and carries the paper thereby accurately adjusted at will to present the proper edge of the paper for pasting and cause wrapping to take place accurately. Upon leaving the small end of the guard 126 the paper and tape, with the now completed tobacco rope, now enter the front portion 127 of the two-part wrapping-tube 7, with the edges of the paper and tape projecting upward, where the paste is applied from a wheel 131 in contact with the paper, as shown in Fig. 20. Immediately after the paper receives the paste the tape and paper reach the crossover-slot 132 on point of separation in the tube and, meeting the diagonal front end of the rear portion 133 of the wrapping-tube, the projecting edge is now turned down, as shown in Fig. 21, and the completed cylinder then enters said tube portion 133 and the pasted edge is pressed down, as shown in Fig. 22, one edge of the tape being now allowed to extend through the side slot 134, as shown. Thereafter the completed cigarette rod 135 emerges from the rear portion 133, as shown in Fig. 23, and is conducted on the now flattened tape, Fig. 24, and delivered upon a bridge 136, Figs. 2 and 3, whence it passes to the cutter-tube 137, Figs. 2, 3, and 47.

The two-part wrapping-tube 127 to 133 is constructed as represented in Figs. 14 and 14^a. It is separated at the point 132, where the slot crosses over from one side to the other to press down the pasted edge, and each of said parts has an attaching-flange 138, by which it is secured in place through the medium of set-screw 139. These parts are longitudinally adjustable, so that they may be accurately fixed in the proper position. A further great advantage in dividing the tube 127 to 133 at the point where the slot crosses over is that it permits the ready and accurate fitting or shaping of this portion of the slot to insure accurate work.

The pasting device will be understood as to its location on the machine upon reference to

Figs. 1, 2, and 3 and as to the relation of its pasting-wheel to the paper upon reference to Fig. 20, while the construction and operation of its parts will be fully set forth with reference to Figs. 25 to 33, inclusive. The edge of the paper 119 protruding from the front end 127 of the wrapping-tube 7 in the position shown in Fig. 20 receives a uniform and constant layer of adhesive substance from the wheel 131, which constantly rotates in contact with said protruding edge. As shown in Figs. 31 to 33, according to one plan the wheel 131 works in contact with a valve-block 140, mounted in a projection 141 on the paste-reservoir 142, and is adjustable therein relatively to the wheel by means of a set-screw 143, having a shouldered bearing in a portion of the valve-block and threaded into the projection 141. The adhesive substance, which for convenience I shall hereinafter designate as the "paste," is forced through an outlet 144 of the reservoir 142 into a duct 145 of the projection 141 and thence through a port 146 of the block 140, whence it escapes to the periphery of the wheel 131. The free escape of paste through the port 146 is prevented by the position of the wheel across said port, and the paste only escapes by adhesion to the periphery of the wheel. By regulating the pressure or space between the block 140 and wheel 131 the thickness of the layer may be increased or diminished. To further regulate the layer of paste to a nicety, I provide the block 140 with a presser-tongue 147, working in a groove 148, that intersects the port 146 in said block and is adjustable relatively to the latter by means of a set-screw 149, having shouldered bearing in said tongue and threaded in the projection 141. By graduating the pressure of the tongue 147 against the periphery of the wheel 131 in the line of the port 146 the layer of the paste escaping on said wheel may be adjusted to a nicety. I prefer, however, to employ the simpler arrangement of paste-discharging means shown in Figs. 27^a, 27^b, and 27^c, wherein the reservoir 142 is cast with a segmental recess in the base, in the wall 142^b of which, formed concentric with the applying-wheel 131, is a vertically-narrow but horizontally-elongated discharge-passage 144^a, against the walls of which the wheel 131 impinges. Said wheel 131 rotates in the direction of the arrow, Fig. 27^b. The forward end of the discharge-passage tapers, so that paste will there escape, while the rear end closes abruptly and provides a contact with the wheel sufficient to prevent the escape of paste rearward. The amount of paste escaping is regulated by pressure of the wheel against the walls of the opening, which pressure is adjusted at will by the eccentric bearing 131^a of the wheel. (See Figs. 27^b and 27^c.)

To insure a constant flow of paste through the port 146, the paste-reservoir 142 is provided with a plunger 150, depressed by a feed-screw 151, working in a nut 152 and rotated by a ratchet-wheel 153, whose dog 154 is

mounted on an arm 155, pivoted at 155^a on an arm 156^b of the bracket 156^a. The arm 155 is oscillated by a vertical shaft 156, journaled in bracket 156^a, which is oscillated by a crank-arm 157 on its lower end, that takes into the groove of a cam-wheel 158, kept constantly rotating through a spiral gear 159, one member of which is on the main shaft 12. In order that the plunger may not be depressed with too great pressure or with greater pressure than is required to expel the paste at the proper rate, the connection between the arm 155 and the shaft 156 is made through the medium of a crank-arm 160, Figs. 25, 26, and 27, which is mounted to turn upon the upper end of the shaft 156, but opposed in turning relatively thereto by a torsion-spring 161, the tension of which may be regulated at will. The arm 160 is connected to the arm 155 through the medium of link 162, so that each time the shaft 156 oscillates its movement will be imparted to the arm 155, and the dog 154, carried by said arm, will cause the plunger-screw to feed downward with a step-by-step movement; but should the pressure beneath the plunger become greater than is required to supply a suitable quantity of paste the arm 160 will impose more work upon the torsion-spring than the latter will perform, and the result will be that the levers yield and there is no rotation of the feed-screw.

It is desirable in practice to adjust the pasting-wheel 131 both vertically and horizontally with respect to the paper edge, and for this purpose the pasting mechanism as a whole is vertically movable on a standard 163 through the medium of a screw 164, journaled at 165 in a part of the pasting device and threaded at 166 in said standard, a set-screw 167, passing through the standard and into the pasting device, securing the parts to any adjustment. Horizontal adjustment of the pasting device is effected by sliding the standard 163 transversely of the machine-table by a screw 168, such adjustment being permitted by the screws 169 passing through slots in the base of said standard, as shown by dotted lines in Fig. 27, and threaded at 170 in the frame, as shown in Fig. 26.

Rotary motion is imparted to the wheel 131 through the medium of spiral gear 171, one member of which is mounted on the shaft 120, that is rotated by the gear 158, Fig. 25. It should be noted that by the nature of the gears 159 and 171, (their teeth being at about forty-five degrees to the plane of their peripheries,) which connect shafts in each instance running at right angles, it is practicable to accomplish all of the limited adjustment desired without interfering with the connection between the gear-wheels, for the reason that the peripheries of these wheels are made broad, so that either wheel may move in the direction of its axis relatively to the other without disengaging the teeth, which are at angles of forty-five degrees to the planes of the respective wheels.

In order to permit the convenient removal of the plunger from the paste-cup without running back the feed-screw by turning it in its nut, said nut 152 is formed in two parts, which are movable and held in position by pins 173 entering the eccentric slots 174 in the parts of the nut, said pins projecting from a collar 175, that may be rotated by the handle 176. Movement of handle 176 in one direction separates the parts of the nut, during which time the screw may slide longitudinally, while movement of said handle in the other direction draws the parts of the nut together for engagement of the screw.

The cutting or severing device is represented in Figs. 35 to 46. The discharge-tube 137 is preferably divided at 177 178 for the passage of severing-blades, (of which I shall describe two types,) by each stroke of which two cigarettes are severed from the cigarette rod. The parts of the discharge-tube 137 are adjustably secured in sockets 179 of the posts 180, which rise from a longitudinally-movable base 181, reciprocated by a projection 182, carrying roller 183, and entering the horizontally-acting groove 184 of cam 185 on shaft 24, which is driven from the main shaft 12 through gear 20, Fig. 1, hereinbefore referred to. (See also Figs. 35, 36, and 39.) The base 181 is guided in its reciprocation by dove-tailed bearing on the table 37, which bearing is adjusted by screws 168, Figs. 1, 2, 25, and 27, through the medium of movable bearing plate or follower 187. 188 represents a standard on the base 181, in which is mounted a vertical slide-bar 189, which carries the blades for severing the cigarettes and by its reciprocation causes the blades to work through the openings 177 178 of the severing or discharge tube 137. The bar 189 is reciprocated by the laterally-presented roller 190 on its lower end, that enters a vertically-acting groove 191 in the rear face of cam 185. These parts are so timed that the rearward stroke of the base 181 and the parts carried thereby coincides with the feed of the finished cigarette rod, and the cutting-blades not only operate at the severing-points during said rear stroke, but withdraw from the line of feed prior to the forward stroke of said parts, so that there is no interference with the cigarette rod to cause buckling or bending. The severed cigarettes are successively discharged from the end of the tube 137 by continued feed of the rod.

The advantages arising from a vertically-sliding cutter mounted on a horizontally-sliding base as compared with a cutter receiving pivotal movement in these directions are that with my arrangement the plane of the cutting instrument is at all times normal to the axis of the cigarette rod to be cut, whereas in the pivotal arrangement the plane of the knives is constantly changing, and with the sliding arrangement greater accuracy and durability are insured.

In Fig. 40 but one severing passage and cut-

ter are shown; but the parts otherwise correspond to those described with reference to Fig. 39. The cutter is preferably made of a pair of cutting blades or jaws 192 193, as shown in Figs. 37 and 38, with a peculiar form of V-shaped cutting edges that produce a crimping effect simultaneously with the severing, as described in my United States Letters Patent No. 647,948, issued April 24, 1900.

The upper jaws 192 are fixed upon the vertical slide-bar 189, while the lower jaws 193 are given an opposite vertical movement either by mounting them upon a shank 194 and working the latter through a rock-arm 195, pivoted at 196 and engaging said shank and slide-bar 189 by its opposite ends, (see Fig. 39,) or preferably, as shown in Figs. 41 and 42, by mounting the lower jaws on arms 197, pivoted at 197^a to the standard 188 and having a rear extension 198, that is engaged by an extension 199 on the slide-bar 189, so that reciprocation of the latter causes opposite movement in said lower jaws, the parts being adjusted so that the jaws meet at the feed-line each time the slide-bar moves downward.

In Figs. 45 and 46 are shown rotary disk knives 201, mounted on shaft 202 in the arms 203, which extend from the slide-bar 189, whereby the knives move vertically through the severing-passages 177 178, said knives being simultaneously rotated by a belt 204, passing from drive-pulley 205 on the main shaft 12 around the grooved wheel 206 on the cutter-shaft 202 between the knives. The belt also passes over an adjustable tightener-pulley 207, supported on a fixed post 208, which may also serve to support a cover for the knives, if desired. The operation of these parts by the compound cam 185 will be readily understood upon comparing Figs. 44 to 46 with Figs. 35 to 39. From the tube 137 the finished cigarettes drop endwise into a discharge-chute 209, through which they pass till they reach a lateral outlet 210, which presents them sidewise upon an endless conveyer 11 in a receiver 212, by which they are carried to the opposite end of the receiver in properly-ordered condition to be boxed. As the endwise travel of the cigarette may cause one end to reach the conveyer 11 in advance of the other and to lie obliquely upon the conveyer, I deflect the discharge end of the chute backward slightly, (see Figs. 1, 48, and 49,) so as to start the foremost end slightly at a disadvantage. The cigarette thus assumes a position transverse of the conveyer.

The conveyer 11 is supported on a bracket 214 from the main frame and is driven by a belt 215, connecting the pulley 216 of the drive-shaft 217 of said conveyer with the pulley 25 on the main shaft 12.

218 represents adjusting-screws for shifting the roller over which the conveyer passes to tighten the latter.

The preferred construction of conveyer and stacker is illustrated in Figs. 50 and 51, wherein 137^a represents an extension of the

discharge-tube, which is supported by a bracket 215 in such relation to the discharge-tube 137 that the latter may execute its reciprocatory movement as hereinbefore described in connection with the cutting operation without withdrawing its outer end from the tube 137^a. The latter tube terminates over a vertical chute 10^a, projecting beyond the vertical plane of the conveyer-belt 11, and said tube 137^a is preferably provided with the extension 137^b, that directs the cigarettes over toward the outer side of the chute 10^a and causes them to turn over in their flight, reverse their direction, and pass inward to a point above the discharge-opening 210, already described, where they escape upon the belt 11. By this means it is immaterial how fast the cigarettes are severed by the cutters, for they will, by their turning and reversing movement, feed successively and uniformly upon the belt and in a position transverse thereto.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a tobacco-feeding mechanism, the combination of the endless apron, rolls around which said apron passes, and a feed-roll cooperating with said apron to compress material fed thereby; said feed-roll pressing the apron against the roll around which the apron passes in rear of the vertical line of said roll's axis, for the purpose set forth.

2. In a tobacco-feeding mechanism, the combination of the endless apron, the bottom over which the apron passes, rolls around which said apron passes, and a feed-roll cooperating with said apron to compress material fed thereby; the axis of said feed-roll being located slightly in rear of the axis of the foremost roll around which the apron passes, and said bottom having a depression under the apron beneath said feed-roll; for the purpose set forth.

3. In a tobacco feeding and dressing device, the combination of an endless apron, a roll about which said apron passes, a pin-roll having its pin extremities traveling contiguous to and in the same direction as and at substantially equal peripheral speed with said apron, whereby said apron deposits and presses tobacco upon said pin-roll as the apron passes around its roll, a concave conforming to the pin-roll beneath the apron for maintaining the layer of tobacco on said pin-roll, and a more rapidly running stripper pin-roll intermeshing with the pin-roll in an arc passing close to the end of the concave, for the purpose set forth.

4. In a tobacco feeding and dressing mechanism, the combination of the endless apron, the roller about which it passes, the feed-roll cooperating with said apron to lay the tobacco uniformly as the apron passes around the roller, the pin-roll located below the plane of the apron, the path of the pin extremities where the apron passes around its roll being contiguous to the apron, the pins traveling at

the same surface speed and in the same direction as the contiguous surface of the apron, the guide-roll opposite the end of the apron for directing tobacco downward upon the pin-roll, the concave holding the layer of tobacco to the pin-roll and a more rapidly running stripper-roll intermeshing with the pin-roll adjacent to the end of the concave.

5. In a tobacco feeding and dressing mechanism, the combination of the feeding-apron and pin-roller moving at similar surface speed, the shaft 16 having driving connection therewith, the concave 54 around said pin-roller, the stripper-roll coöperating with the pin-roll and having relatively higher surface speed and driving connections for converting motion from said shaft 16 into said higher speed of the stripper-roll, consisting of the bevel-gears 66, and multiplying-gear 64, 65, substantially as set forth.

6. The combination with the feed-apron and its driving-roller at its foremost end, the feed-roll adjacent to said driving-roller and moving at equal surface speed with the feed-apron, the pin-roll moving with the feed-apron and at equal surface speed, the guard-roll, and a suitable stripper; of gears upon the shafts of said driving-roller, feed-roll, pin-roll, guard-roll and stripper, the shaft 16 in a plane transverse to the axes of said roller and rolls, the gear 58 on the shaft of the pin-roll driven by said shaft 16, the broad face gear 61 also on the pin-roll shaft and driven with gear 58, overlapping gears 61, 62 on the shafts of the apron-driving roller and guard-roll respectively, both meshing with the broad face gear, a gear on the shaft of the feed-roll meshing with one of said overlapped gears, and driving connections between the shaft 16 and the stripper, said gears being proportioned to give to their driven parts the relative motions specified.

7. In a tobacco feeding and dressing mechanism for cigarette-machines, the combination of the feed-apron, and its driving-roll located at its forward end, the feed-roll and pin-roll located respectively above and forward of said driving-roll and moving with their contiguous faces in the same direction as the apron and at similar surface speed, and the stripping-roll rotating with its contiguous face in a direction opposite to the pin-roll and at a greater surface speed; with means for driving said rolls at the relative speeds specified consisting of intermeshing gears 61, 63 on the driving-roller and feed-roll respectively, a gear 60 on the pin-roll meshing with the gear 61 of the apron-driving roll, a shaft 16 in a plane transverse to the axes of the rolls having worm-gear connection 57, 58 at its upper end with the shaft of the pin-roll, bevel-gears 66 at an intermediate point on the shaft 16, a multiplying-gear 65 driven by said bevel-gear 66 and gear 64 on the stripping-roll driven by said multiplying-gear 65.

8. In a cigarette-machine, the combination of the frame formed with the vertical offset

providing upper and lower tables, the tobacco-rope-forming belt moving over the upper table, a supporting-wheel for said belt projecting through the lower table, and belt-forming wheels supported from the end of the upper table and overhanging said belt-supporting wheel, substantially as and for the purpose set forth.

9. In a cigarette-machine, the combination of the frame, formed with a vertical offset dividing it into upper and lower tables, the tobacco-rope-forming belt working over the upper table, the bracket at the end of said upper table overhanging the lower table, and belt-shaping wheels mounted on vertical axes in said bracket.

10. A tobacco-rope-forming mechanism for cigarette-machines comprising a single belt, a flat guide-wheel over which said belt travels, a presser-wheel driven by the contact of said belt, and laterally-adjustable means pressing opposite sides of said single belt upon the sides of the presser-wheel.

11. In a tobacco-rope-forming mechanism for cigarette-machines, the combination of a single belt, a guide-wheel over which said belt passes, a presser-wheel located above said belt and an independent belt-forming wheel on each side of the presser-wheel, pressing said belt into contact with the wheel and rotating the latter substantially as set forth.

12. In a tobacco-rope-forming mechanism for cigarette-machines, the combination of means for delivering tobacco, a belt, means for guiding and driving the belt, an idle presser-wheel above said belt, and means for sloping the belt up on opposite sides of the idle presser-wheel and pressing said belt into driving contact with said wheel, whereby its periphery has the same surface travel as the belt.

13. In a tobacco-rope-forming mechanism for cigarette-machines the combination of a belt, means for guiding and driving said belt, an idle presser-wheel above said belt and idle belt-forming rolls on opposite sides of, and pressing the belt against said idle presser-wheel and causing the presser-wheel and belt-forming rolls to be driven by the belt.

14. In a rope-forming mechanism for cigarette-machines the combination of a single belt, means for guiding and driving said belt, a vertically-adjustable idle presser-wheel above said belt, and lateral belt-forming rolls on axes perpendicular to the axis of the presser-wheel and having flat peripheries forming the belt and pressing it into driving relation to the presser-wheel, without obstructing the latter's adjustment.

15. In a rope-forming mechanism for cigarette-machines the combination of a single belt, a presser-roll above said belt, and rolls shaping the single belt by pressing opposite edges of said belt against opposite sides of the presser-roll.

16. In a rope-forming mechanism for cigarette-machines the combination of a single belt, means for guiding and driving said belt,

an idle presser-wheel above the belt, and independent lateral forming-rolls pressing the belt into driving contact with the sides of the idle presser-wheel and journaled on axes perpendicular to the axis of the presser-wheel and adjustable relatively thereto.

17. In a tobacco-rope-forming mechanism, the combination of the single belt, means for guiding and driving said belt, the idle presser-wheel, mounted on a horizontal axis above the belt, and the independent lateral belt-former rolls pressing the belt against the presser-wheel and mounted on eccentrically-supported vertical axes, whereby they are adjustable to and from the presser-wheel.

18. In a tobacco-rope-forming mechanism, the combination of the single belt having means for guiding and driving said belt, the idle presser-wheel mounted on a horizontal axis above the belt, the belt-former rolls mounted on independent vertical axes on opposite sides of the presser-wheel and pressing the belt into driving contact therewith, and the bifurcated bracket having arms providing supports for the horizontal axis of the presser-wheel, and hangers providing supports for the vertical axes of the belt-former rolls.

19. In a tobacco-rope-forming mechanism, the combination of a single belt, having means for guiding and driving it, a plurality of idle presser-wheels for pressing the tobacco in said belt and pairs of side-pressing forming-rolls for shaping the belt at each presser-wheel, and pressing it into driving relation to said wheels.

20. In a tobacco-rope-forming mechanism, a single belt, having means for driving and guiding it, a plurality of idle presser-wheels pressing tobacco in said belt, and a corresponding number of pairs of idle rolls forming the belt and pressing upon the sides of the respective presser-wheels, and causing the belt to drive said wheels and rolls.

21. In a tobacco-rope-forming mechanism, the combination of a tobacco-feeding belt, a preliminary presser-wheel of relatively broad periphery, pressing tobacco in said belt, belt-forming wheels cooperating with said preliminary pressing-wheel, a pressing-wheel of relatively narrow periphery, subsequently pressing tobacco in said belt, and a pair of belt-forming wheels shaping the belt against said narrower pressing-wheel, substantially as set forth.

22. The combination of the rope-forming belt, having means for guiding and driving it, the pressing-wheel and belt-forming rolls cooperating with and driven by said belt, the supplemental presser-wheel, gears carried by the respective pressing-wheels, an idler-gear connecting said wheel-gears, and causing the supplemental presser-wheel to be driven at the same rate as the belt.

23. In combination with a tobacco-rope-forming belt, the belt-tightener formed of a hanger supported concentrically with the

wheel about which the belt passes, a roller on said hanger for deflecting the belt to tighten it, a brush also on said hanger, impinging the belt and having driving connection from the belt-roller, and suitable adjusting means for said tightener; substantially as set forth.

24. The combination with a drive-wheel in a cigarette-machine, a belt-tightener comprising a hanger hung concentric with the drive-wheel axis, a belt-tightener roller journaled in said hanger, and a brush also journaled in said hanger, impinging the belt to clean it, geared to the tightener-roller so as to be driven by the latter, and adjustable to and from the drive-wheel.

25. In a cigarette-machine, the combination with the tape and its driving-wheel of the presser-roll pressing the tape upon its driving-wheel, the bracket for supporting said presser-roll adjacent to said wheel, the axle for said roll being eccentrically trunnioned in said bracket, and a removable bushing surrounding one of the trunnions in the bracket, whereby the axle is withdrawable through the bracket as explained.

26. In combination with the wrapping-tape of a cigarette-machine, the guide-roll over which it passes, and means for shifting the axis of said guide-roll to determine the line of feed of said tape.

27. In a cigarette-machine, a tape-adjusting device consisting of a roller over which the tape passes, an axle on which said roller turns, and means for adjusting one end of said axle to change the angle of the roller, substantially as set forth.

28. In a cigarette-machine, the combination of a tape-guiding roller, an axle for said roller having its ends pivotally and movably supported, respectively, and a set-screw for adjusting the movable end, substantially as set forth.

29. In a wrapping mechanism, the combination of a roller over which the tape separately passes, and a pair of rollers around which tape and paper successively pass together to cause the paper to be propelled by the tape; said roller over which the tape passes alone being adjustable angularly, substantially as set forth.

30. In a cigarette-machine, the combination of a pasting mechanism, adjustable vertically and horizontally, and comprising a paste-feeding device, a paste-applying device, driving-shafts for said devices extending in the respective directions of adjustment of the whole mechanism, and spiral gears transmitting power to said shafts, whereby their driving connections are not interfered with by the adjustments, substantially as explained.

31. In a cigarette-machine, a pasting device provided with a feed-screw, means for turning said feed-screw and a yielding turning connection between them, whereby the feeding of the screw is stopped under abnormal pressure of the feed.

32. In a cigarette-machine, the combination

of a pasting-receptacle, a plunger therein a feed-screw controlling said plunger, a dog and ratchet turning said feed-screw, a shaft imparting movement to said dog and a yielding
5 connection between said shaft and the dog, whereby undue pressure beneath the plunger will cause said yielding connection to yield and stop the feed, substantially as set forth.

33. In a cigarette-machine, the combination
10 of a pasting-receptacle, a plunger therein controlled by a feed-screw, a dog and ratchet for turning said feed-screw, a shaft a yielding connection between the shaft and said dog which undue pressure beneath the plunger
15 will cause to yield and stop the feed, and means to adjust tension on said yielding connection.

34. In a cigarette-machine, the combination of the paste-receptacle, the plunger having a
20 screw connected thereto, a movably-mounted dog and a ratchet for turning said screw, a lever connected with said dog, a shaft upon which said lever is mounted, and a torsion-spring through the medium of which the lever
25 is oscillated by the shaft; substantially as set forth.

35. In a cigarette-machine, the combination of a paste-reservoir, an expelling-plunger therein, a screw feeding said plunger, a dog
30 and ratchet turning said screw, a lever upon which said dog is mounted, a turning shaft having suitable connections through which it is oscillated, a crank-arm having a turning bearing on said shaft and linked to said lever,
35 and a torsion-spring interposed between the torsion-shaft and its crank-arm to cause the latter to move with the former.

36. In a cigarette-machine, the combination with a reciprocating cutter mounted upon a
40 reciprocating base; of a cam having a peripheral cam-groove engaging a part of the reciprocating base and a face cam-groove engaging a part of the cutter.

37. The combination of the horizontally-
45 slidable base, the vertically-sliding cutter-bar mounted on said base, projections extending downwardly from said base and cutter-bar, and a cam having a horizontally-acting groove and a vertically-acting groove,
50 acting respectively upon the projections on the base and cutter-bar.

38. In a cigarette-machine, the combination of a reciprocating cutter-base, the cutter
55 mounted to reciprocate therewith and having an independent cutting movement, projections respectively on the base and cutter, and a cam having a face cam-groove and a peripheral cam-groove engaging the respective
60 projections and imparting through them the designed movements to the base and cutter.

39. In a severing device for cigarette-machines, the combination of the sliding base, the standard on said base, the cutter-bar working in said standard, a cutting jaw or
65 jaws carried by said cutter-bar, a cooperating cutting jaw or jaws pivoted on the standard and engaged by a part moving with the cutter-bar, to cause it to move toward the cutting jaw or jaws first named and the cam for reciprocating the base and cutter-bar, as explained.
70

40. In a severing device for cigarette-machines, the combination of the base, the standard and discharge-tube mounted on said base, the reciprocating cutter-bar mounted in said
75 standard, an upper cutting-jaw fixed upon the cutter-bar and caused thereby to intersect the feed-line of the discharge-tube, a lower cutting-jaw pivoted upon the standard, swinging upward to the upper jaw, projections on the respective jaws that engage to
80 cause the jaws to approach and recede as the cutter-bar reciprocates and a cam reciprocating said cutter-bar.

41. In a cigarette-machine, a discharger
85 and conveyer comprising a traveling belt, a discharge-tube discharging transversely to said belt, and a chute which directs the cigarettes from said tube to a point beyond the belt and causes them to turn and approach
90 the belt endwise in the direction opposite to that in which they are discharged, substantially as herein explained.

42. In a discharger and conveyer for cigarette-machines, the combination of the belt,
95 a discharge-tube extending across said belt, a chute which receives the cigarettes from said tube, extending beyond the side of the belt and having a bottom inclined back toward the belt, and a discharge-opening which
100 delivers the cigarettes transversely upon the belt, substantially as set forth.

43. In a cigarette-machine, the combination of means for severing and discharging cigarettes having a discharge-tube, a belt running transversely to the discharge-tube and
105 across which said discharge-tube projects, a chute into which the discharge-tube delivers and which turns the cigarettes over and directs them in the reverse direction toward the
110 belt and delivers them in transverse position upon the latter, and a cam for actuating the severing means and reciprocating the severing-tube simultaneously, as explained.

Signed at Cincinnati, Ohio, this 22d day of
115 March, 1900.

NAPOLEON DU BRUL.

Witnesses:

H. UHYRICH,

E. H. MOELLMANN.