

(No Model.)

10 Sheets—Sheet 1.

F. J. D. CHAPPELL, Dec'd.

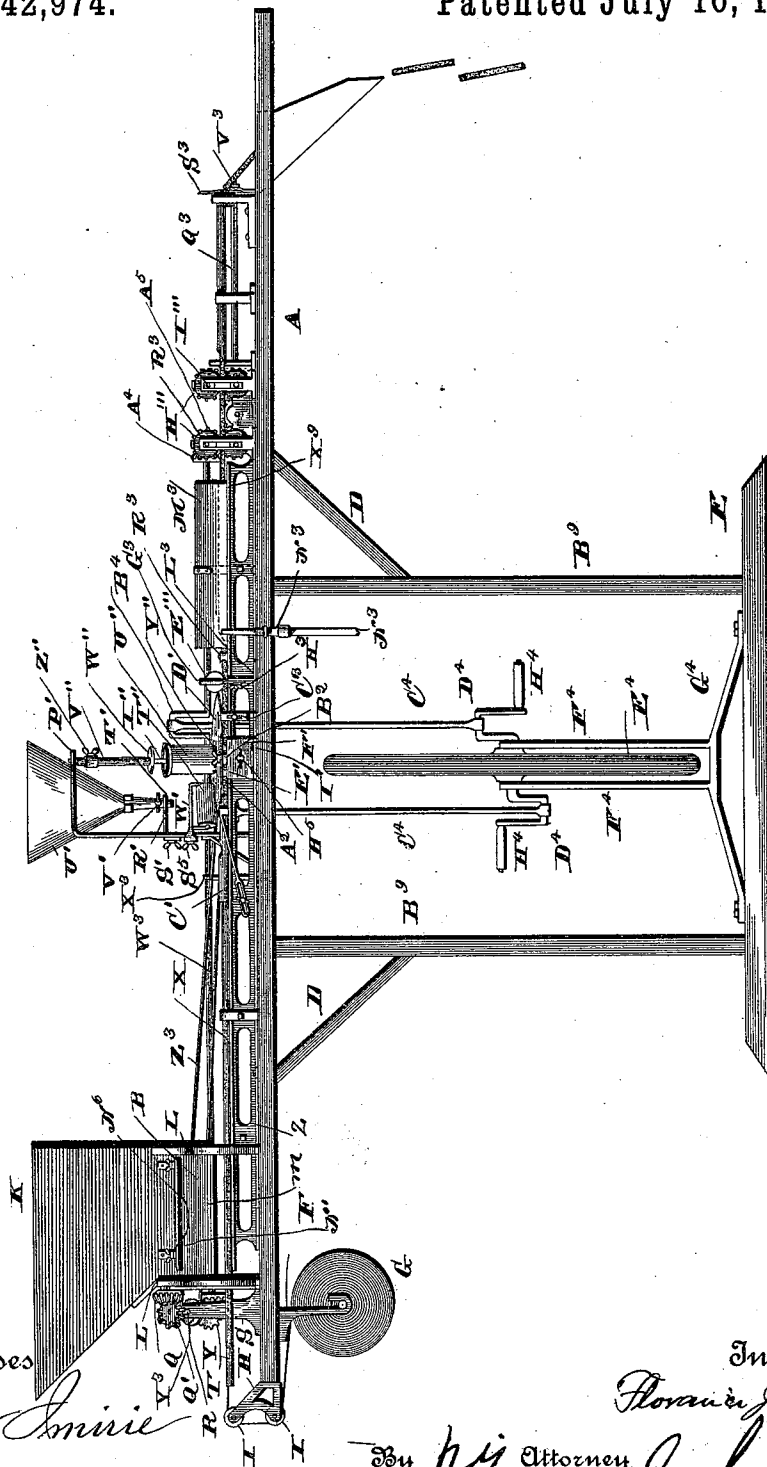
A. E. SLADE, Administratrix.

CIGARETTE MACHINE.

No. 542,974.

Patented July 16, 1895.

Fig. 1.



Witnesses

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Inventor

Florian J. D. Chappell

By his Attorney

Geo. H. Schroeder

(No Model.)

10 Sheets—Sheet 2.

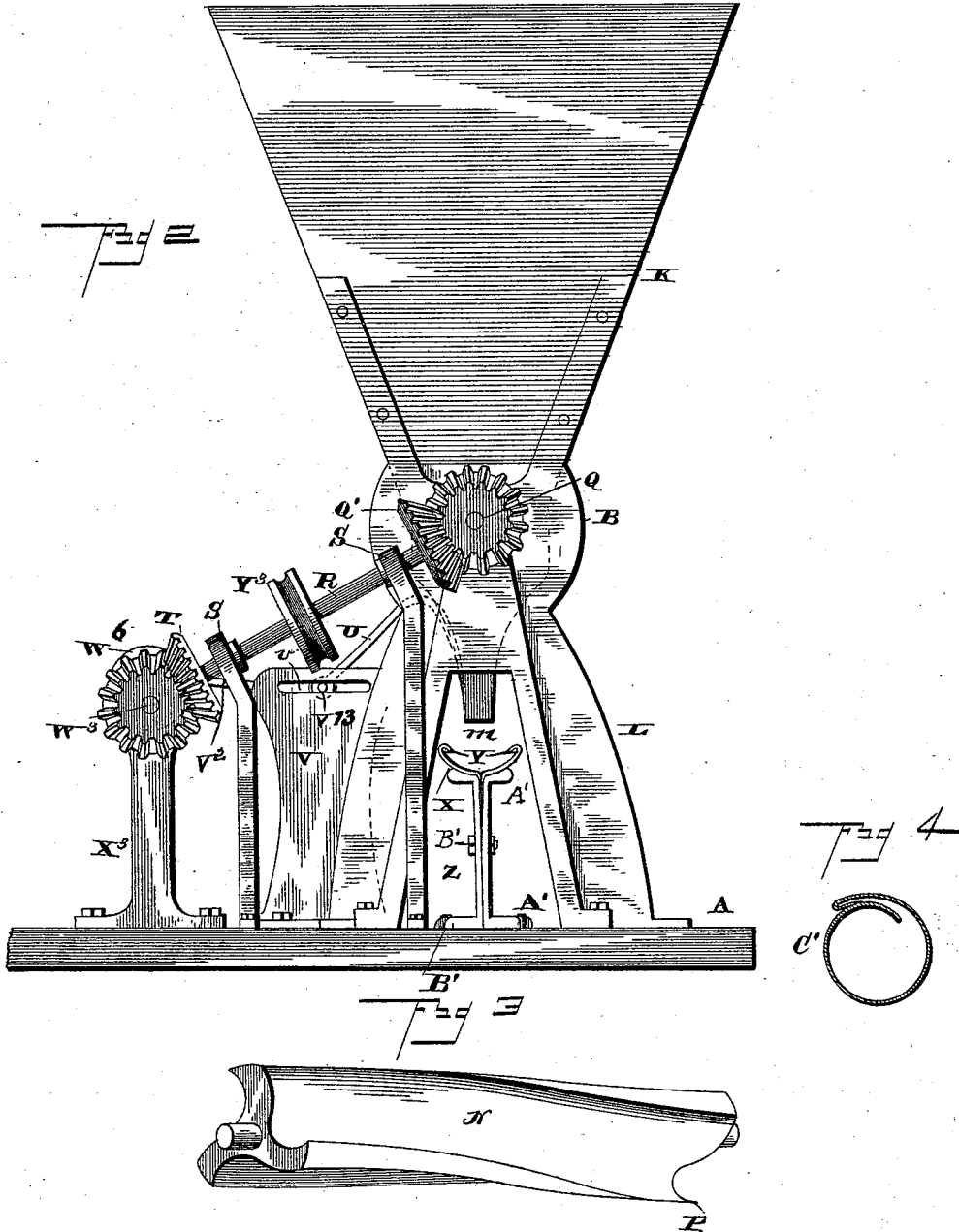
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10 Sheets—Sheet 3.

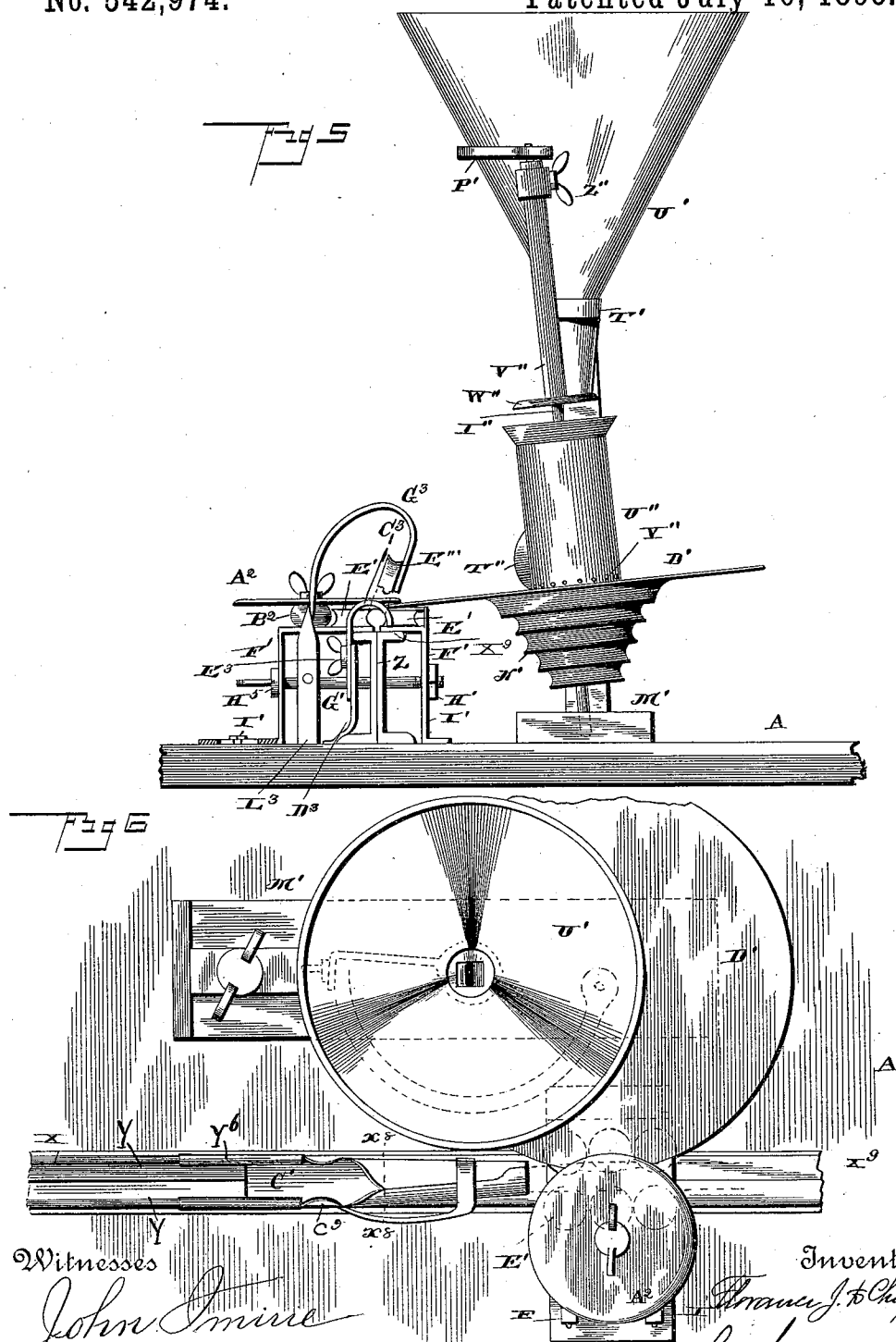
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Witnesses

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(No Model.)

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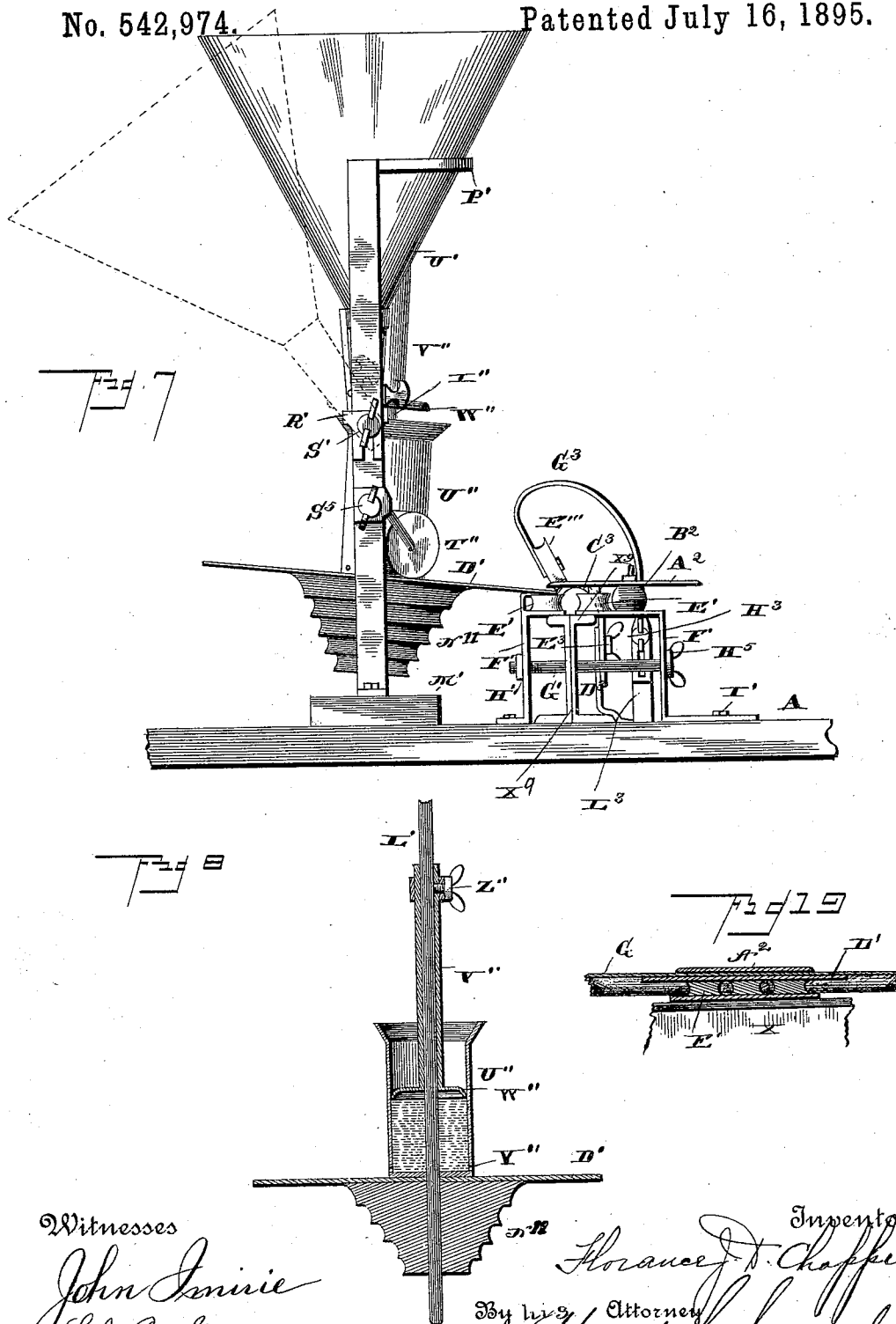
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Witnesses

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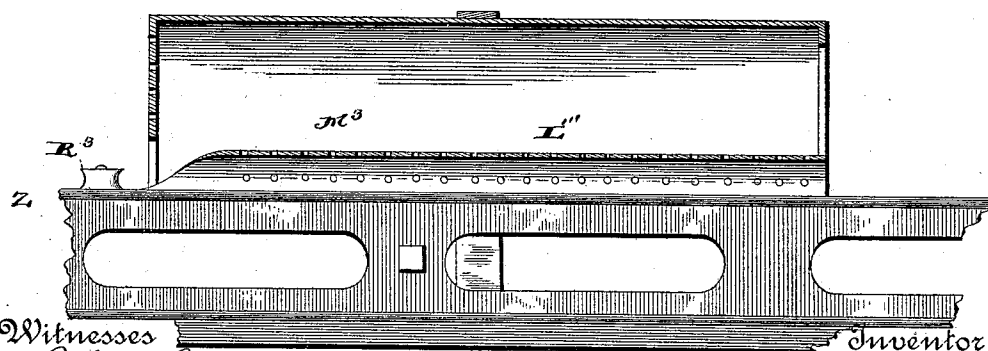
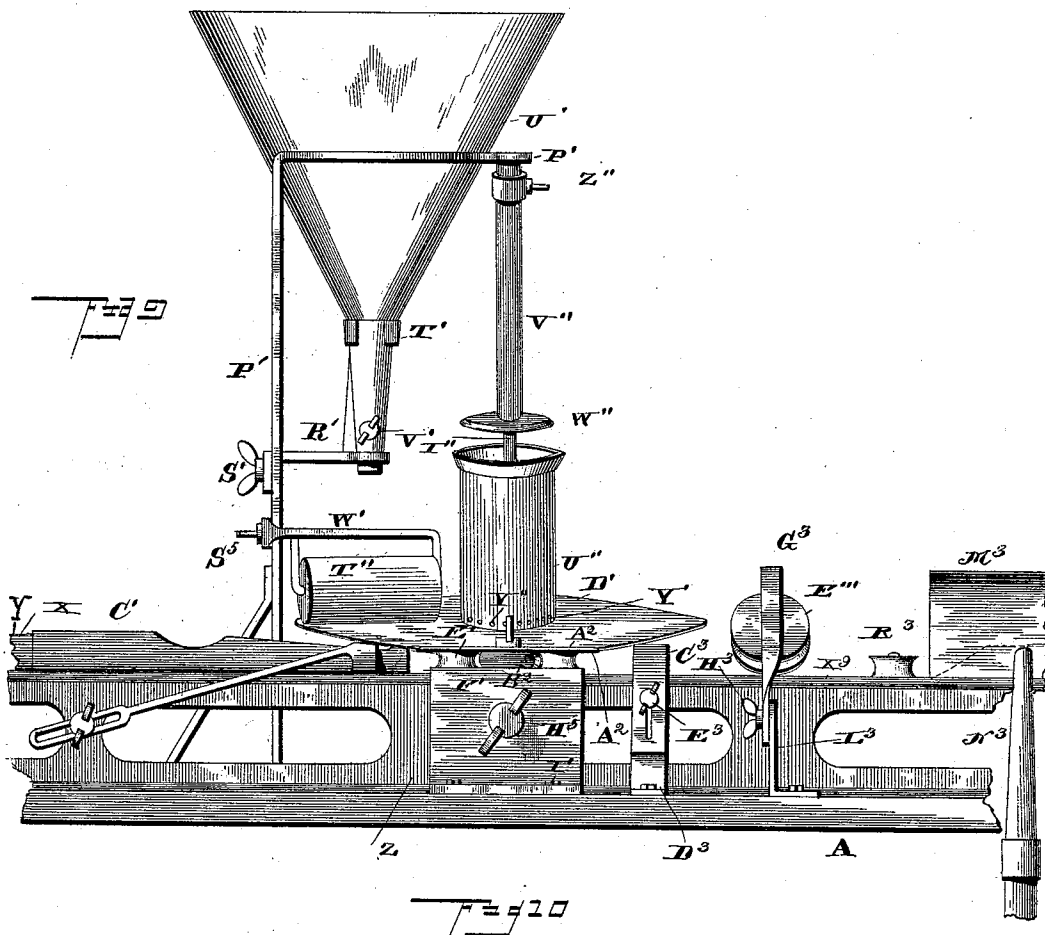
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10 Sheets—Sheet 6.

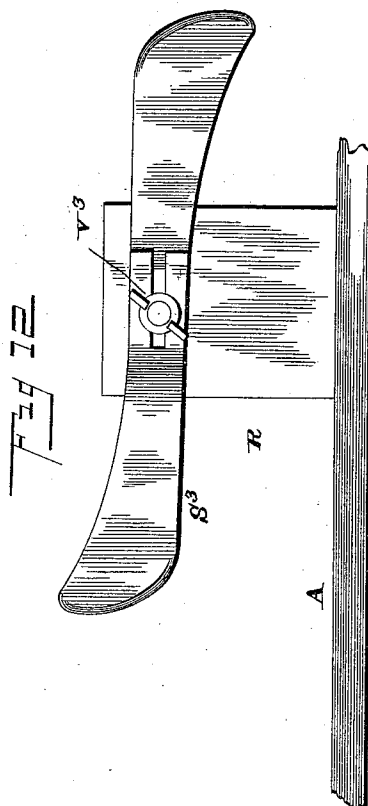
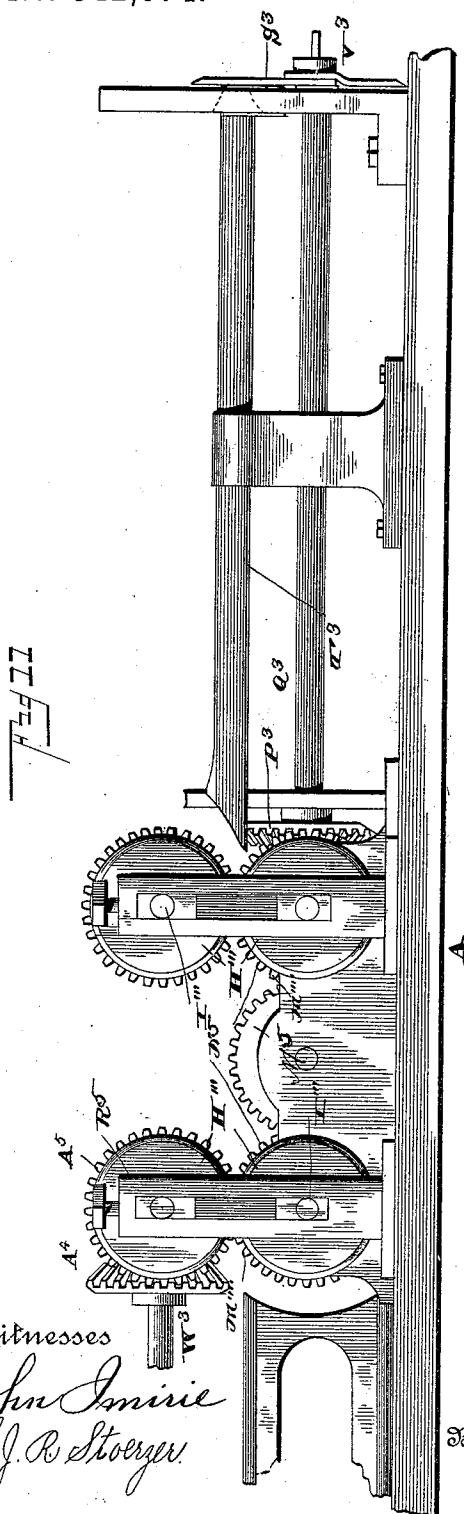
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(No Model.)

10 Sheets—Sheet 7.

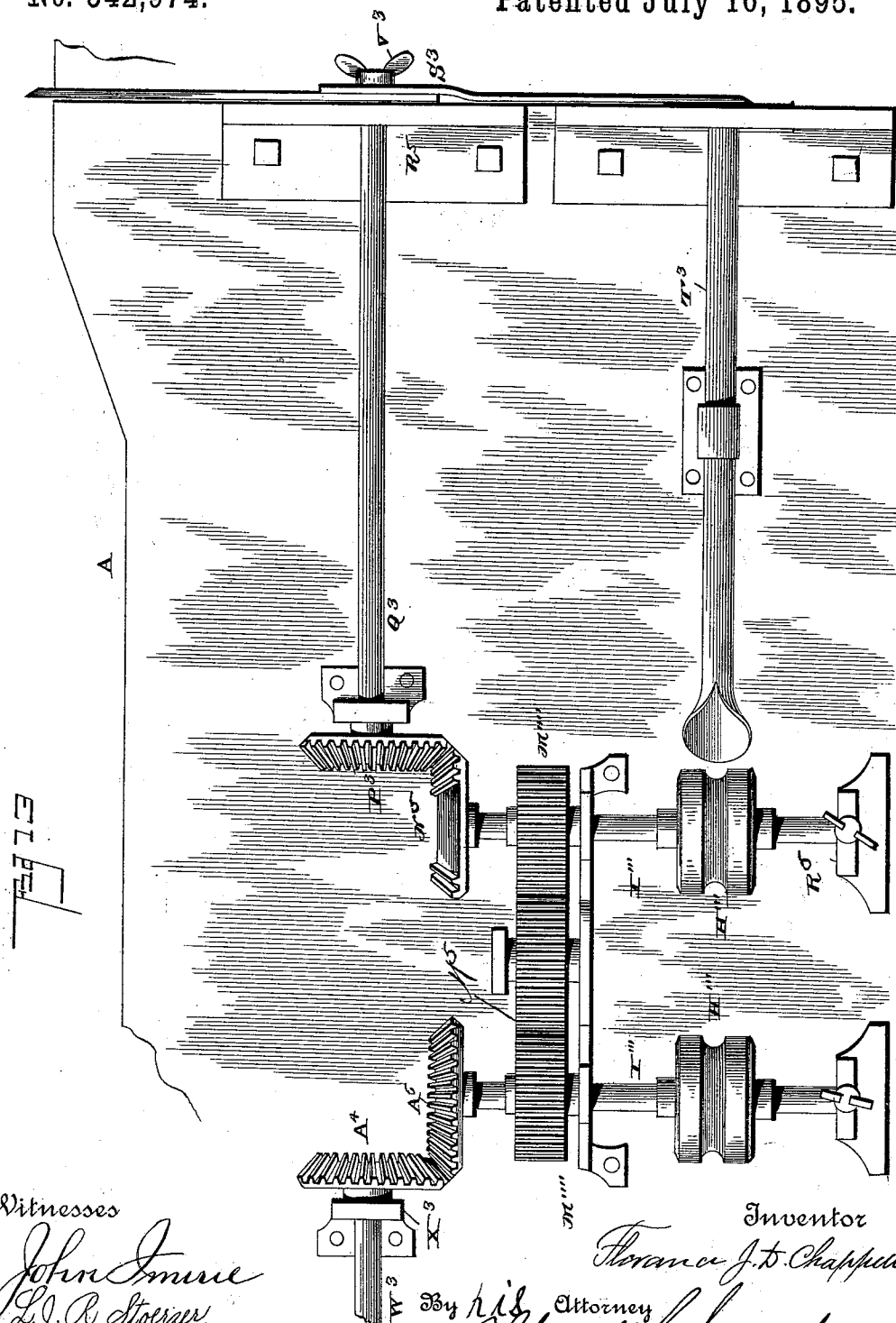
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Witnesses

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(No Model.)

10 Sheets—Sheet 8.

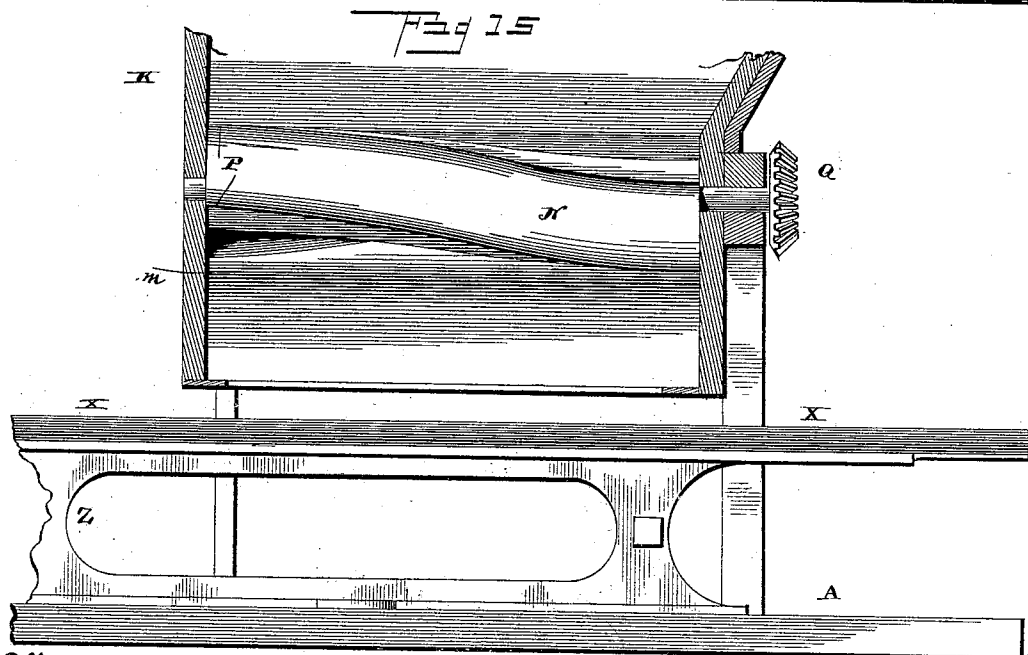
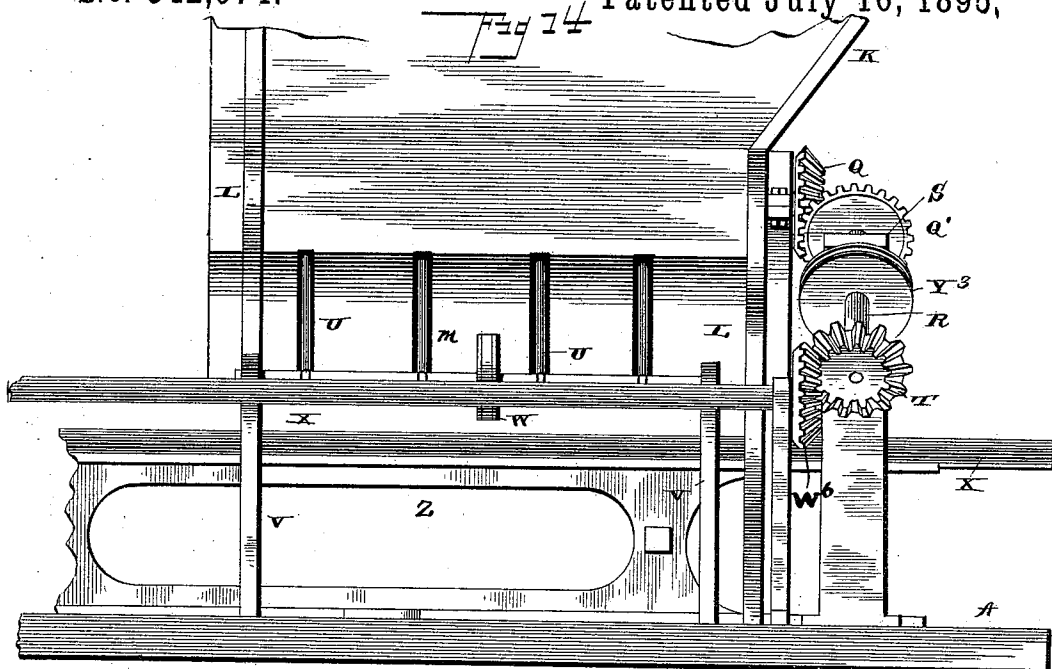
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John Imrie
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(No Model.)

10 Sheets—Sheet 9.

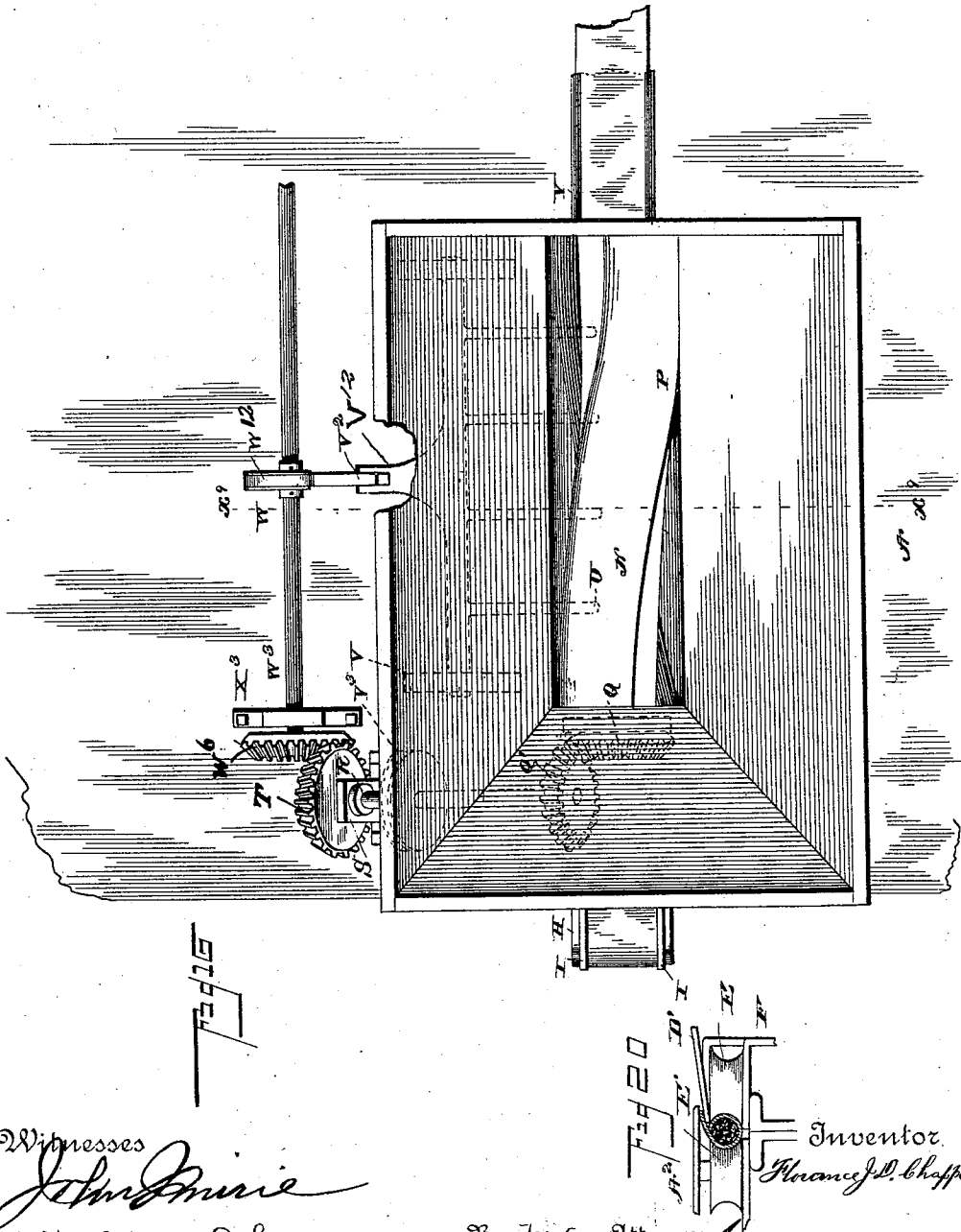
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No. 542,974.

Patented July 16, 1895.



Witnesses
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John Shaw

Inventor
F. J. D. Chappell
By his Attorney
Henry Schneider

(No Model.)

10 Sheets—Sheet 10.

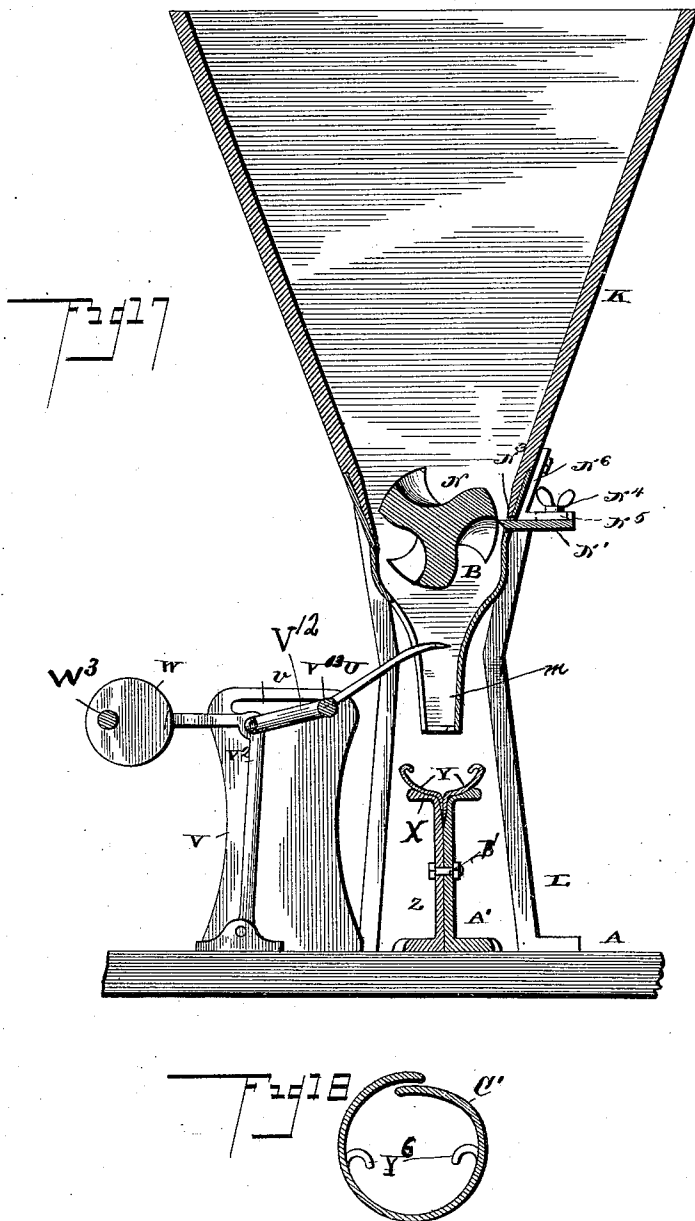
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Patented July 16, 1895.



Witnesses

John Murie
John Shaw

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Florano J. D. Chappell

By his Attorney

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UNITED STATES PATENT OFFICE.

FLORANCE J. D. CHAPPELL, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF TO S. C. SLADE, OF SAME PLACE; AMELIA E. SLADE ADMINISTRATRIX OF SAID CHAPPELL, DECEASED.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 542,974, dated July 16, 1895.

Application filed June 19, 1890. Serial No. 355,987. (No model.)

To all whom it may concern:

Be it known that I, FLORANCE J. D. CHAPPELL, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Cigarette-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in that class of machines for making cigarettes in which the cigarette is formed continuously and cut into proper lengths; and it has for its object to provide for automatically moving the paper, distributing the tobacco, forming the cigarette, pasting the overlapped edges of the same, quickly drying, and, finally, cutting the continuous cigarette into suitable lengths, as more fully hereinafter explained.

The above-mentioned objects are obtained by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of the machine complete. Fig. 2 represents a front end elevation thereof. Fig. 3 represents a detached perspective view of a cutter for the tobacco before it feeds it into the chute to be distributed to the paper. Fig. 4 represents a transverse sectional view of the "former" near the delivery end, looking toward the cutter and in the reverse direction to Fig. 18. Fig. 5 is an enlarged elevation, in detail, of one side of the machine, showing the pasting mechanism thereof. Fig. 6 is a top plan view thereof. Fig. 7 is an elevation similar to that shown in Fig. 5, representing the opposite side of the pasting mechanism. Fig. 8 is a detached vertical section view of the mechanism for supplying thick paste to the pasting disk of the machine. Fig. 9 is a perspective view of a portion of the machine, showing the former and the pasting, closing, and drying mechanism. Fig. 10 is a detached view of the drying devices enlarged. Fig. 11 is a side elevation of a portion of the ma-

chine, showing the mechanism for delivering and cutting the continuous cigarette. Fig. 12 represents a rear end view of a portion of the machine, enlarged, showing the cutting-knife in detail. Fig. 13 represents a top plan view of the same portion of the machine. Fig. 14 represents a rear side elevation of the hopper, enlarged, showing a portion of the tobacco-distributing mechanism and eccentric on driving-shaft. Fig. 15 represents an enlarged longitudinal view taken through the hopper of the machine. Fig. 16 is a plan view of the hopper and parts contiguous thereto. Fig. 17 is a vertical transverse section on lines $x^3 x^3$ of Fig. 16. Fig. 18 is a detail vertical transverse section on line $x^3 x^3$ of Fig. 6. Fig. 19 is a detail showing the mechanism for applying paste to the wrapper. Fig. 20 is a detail view showing the position of the wrapper while the paste is being applied thereto.

Referring to the drawings, A indicates a horizontal table supported upon vertical legs or uprights B⁹, the extended sides being upheld by oblique braces D. The lower ends of the legs are securely fastened to a suitable base E or to the floor of the building, so that the table will be firmly supported. Near the left-hand or forward end of the table and to the under side thereof are secured two hangers F, which have bearings for the shaft of the roll of paper G, which consists of a strip of suitable width for the wrapper of the continuous cigarette.

At the extremity of the left-hand or forward end of the machine is secured a frame H, in which are journaled the shafts of two rollers I, over which the paper from the roll is passed, as shown in Fig. 1 of the drawings.

K indicates a hopper, which is located on top of the table near the forward or left-hand end thereof. The said hopper is supported upon standards L, as particularly shown in Fig. 2 of the drawings. Below the hopper and connected therewith is a distributing-chamber B, the lower sides of which are extended downwardly, forming a chute *m*, which extends longitudinally over the course of the paper strip. Within the distributing-chamber is located a longitudinally-disposed cutter N, having spirally-arranged fluted blades

P, provided with sharp cutting-edges, which shear the tobacco as it descends from the hopper and cut and deliver it in proper quantities to the distributing-fingers, hereinafter mentioned, which carry it down through the chute to the paper strip. The journals of the said cutter have their bearings at each end of the distributing-chamber, the forward journal projecting beyond its bearing having fastened on it a miter cog-wheel Q, which intergears with a similar wheel Q' on an oblique shaft R, journaled in bearings in the standards S, secured to the base of the machine or the floor of the room in which the machine is located. The said shaft is also provided with a mitered cog-wheel T, which intergears with a similar mitered cog-wheel at one end of the main driving-shaft of the machine, to be more fully hereinafter described.

The blades of the cutter N cut against the edge of the knife N', which is inserted in the chamber B through the horizontal slot N³ in the side of the latter, the knife being adjustably and removably held in place by the bolt N⁴, passing through the transverse slot N⁵ in the bracket N⁶, secured to the side of the chamber B, in order to permit its ready removal for sharpening and subsequent adjustment.

The chute *m*, which may be regarded as a part of the distributing-chamber, at the rear side is provided with a series of parallel slots, through which are adapted to work a series of distributing-fingers U, which seize the tobacco as it is cut from the supply in the hopper and discharge it through the chute upon the paper. The said fingers are formed of a series of bent wires, constituting levers, which are secured to the forward side of the sliding rocker-shaft V¹³, the opposite ends of which are carried in slots *v* in the standards V, secured to the top of the table, the rear side of the said shaft being connected by a forked arm V¹² to angle-lever V² at the elbow thereof, the base of one arm of the said elbow-lever being pivoted to the table, while the opposite arm projects rearwardly and is connected with the collar W¹², encircling the eccentric W upon the main driving-shaft, to be hereinafter mentioned. It will now be evident that upon rotating the eccentric the fingers will be thrown forward and downward and drawn upward and backward, thus causing the tobacco cut by the cutter to be fed.

Below the chute is located the paper-guide X, consisting of two lateral flanges Y at the top of a split standard Z, secured to the top of the table and extending longitudinally under the chute, the said devices forming the bed upon which the continuous cigarette is formed. The said flanges at their upper ends are curved inwardly, so as to partially fold the paper as it is carried forward to the former, in order to wrap the tobacco in the continuous paper wrapper. The split standard, which is provided with the lateral

supporting-flanges, is also provided with bolts B', by means of which its two members may be drawn together to hold the separate guides of different size. The forward end of the guide extends beyond the hopper and chute and connects with a former C', which commences as a semicircle in cross-section at its point of connection with the guide, it having flanges Y⁶ thereon, and is gradually contracted and curved toward its delivery end, one side being made to overlap the other at such end, and in order to form a tube of uniform diameter, being bent back upon itself, as shown in Fig. 3, so as to serve as a guide for that edge of the paper that is laid over the other, the paper passing through the said former being wrapped around the tobacco, ready for the pasting operations, which occur at the next step in the operation of the machine. The delivery end of the former C' terminates just in front of the paste-applying disk D' and guide-rollers E' E'. These rollers have their journals mounted in bearings in the upper end of the standards F' F', adjustably secured to the table, so that the rollers may be set to or from each other, according to the diameter of the cigarette to be formed in the machine. The adjustment of the standards is affected by means of a bolt G', having a fixed nut H' and a thumb-nut H⁵, the base of one standard being slotted and confined by a bolt and nut I' to the table in such manner that it can be moved back and forth to any desired position. The rollers are grooved at their peripheries to correspond to the contour of the cigarette and below them extend longitudinally the split standard Z and bed X³, which support the cigarette as it passes through the rollers during the pasting operation.

The paste-applying disk D' is mounted upon an oblique shaft I'', having its lower journal-bearing in a block M', secured to the table of the machine in such a position that the edge of the disk at one side will pass between the overlapped edges of the paper wrapper around the tobacco as the paper and tobacco pass from the former. The shaft below the disk is provided with a series of conepulleys N'' for the purpose hereinafter explained. The upper end of the oblique shaft has its bearings in the bent end of a standard P', which is secured to a block M', above mentioned.

The letter R' indicates the bracket, which is bent at its rear end and slotted at such bent portion, as shown in Fig. 7 of the drawings, and confined adjustably to the standard P' by means of a clamp-nut S' for the purpose hereinafter explained. The said bracket has a vertical extension having a split-ring seat T', in which is supported a paste-distributing funnel U', the funnel being designed for thin liquid paste and provided with a cock or valve V', by means of which the flow of the paste to the disk below may be regulated.

W' indicates another bracket, which is ad-

justably secured to the standard B' by means of a clamp-nut S⁵ and which carries a distributing-roller T'', bearing against the upper face of the paste-applying disk and which distributes the paste to the edge of the upper side of the disk ready to be applied between the overlapped edges of the strip of paper inclosing the tobacco as it is delivered from the former. This bracket is adjustable to any angle.

To the center of the paste-applying disk at the upper side thereof is secured a cylindrical receptacle U'', having a flanged mouth. The supporting-shaft of the disk passes through said receptacle, and above the receptacle it is provided with a movable sleeve V'', having a follower W'' at its lower end, which bears upon the paste in the receptacle and presses it outward through apertures Y'' to the upper surface of the pasting-disk, where it is mixed with the liquid from the funnel, being thus thinned, it being caused to flow to the edge of the said disk by the centrifugal force of the rotation thereof, it being evenly spread on the said edge by the distributing-roller. The said sleeve is provided with a collar and set-screw Z'' at its upper end, by means of which it may be adjusted from time to time in position. A comparatively-stiff paste is contained in the receptacle U'' and when forced therefrom by the follower, as above stated, flows upon the upper surface of the disk, where it mixes with the liquid from the funnel U' and assumes the desired consistency.

The letter A² indicates a pressure-plate secured to a yielding block B² of rubber or other material attached to the horizontal bracket of one of the standards. This plate is so located as to overset the edge of the paste-applying disk (see Fig. 20) above the upper overlapped edge of the paper of the cigarette and presses it down upon the pasting-disk, so as to insure the application of the paste thereto during the operation of the machine.

The letter C³ indicates an adjustable closer consisting of a strip of metal bent into the form of a half-circle or approximately thereto at its upper end and slotted longitudinally through its vertical portion. The said closer is adjustably secured to a vertical standard D³, secured to the front of the table of the machine by means of a set-screw E³, so that it may be brought closely down over the continuous cigarette while moving to close the overlapped parts.

E''' indicates a grooved pressure-roller, which has its shaft journaled in a bearing in an overhanging bracket G³, which is slotted through its vertical portion and adjustably secured by means of a set-screw H³ to a vertical standard L³, attached to the front of the table. The groove in the periphery of the roller corresponds to the size and contour of the continuous cigarette and presses the overlapping edges of the paper together, so as to close the same.

The letter R³ indicates two grooved guide-rollers, located at the right of the pressure-roller and journaled to the top of the cigarette-supporting bed to guide the continuous cigarette to the drier after the pasting has been effected. The said drier consists of a foraminous or reticulated tube L''', Fig. 10, secured to the supporting-bed and of the same internal diameter as the cigarette. The said tube at its forward end has a beveled mouth to facilitate the entrance and forward passage of the cigarette through it. The said foraminous or reticulated tube is inclosed in an oversetting-jacket M³, which at its forward end has draft-openings for the admission of air and in the rear to allow the escape of superfluous heat. Into the forward end of this jacket extends a gas-jet N³, through which gas in regulated quantities may be supplied to the jacket, so that when ignited therein the heat thereof will quickly dry the pasted parts of the cigarette.

To the right of the drier are located two sets of drawing-rollers H''' H''', which are grooved on their peripheries to correspond to the contour of the continuous cigarette. These rollers may be constructed of any suitable material, preferably of hard rubber, but the grooves in their peripheries are lined with soft rubber or other material in order to grasp and carry forward the cigarette without abrading or otherwise injuring it. The said rollers are mounted upon transverse shafts I''', journaled in pillow-blocks R⁵, secured to the top of the table, as shown particularly in Figs. 11, 13, and 14 of the drawings. These shafts of the lower wheels are provided with cog gear-wheels M''', at one end meshing with a common intermediate cog-wheel M⁵ mounted in a journal having bearings in a support on the table, so that the wheels will travel isochronously in the same direction when the machine is in operation. The right-hand shaft I''' is provided at its rear extremity with a miter-beveled cog-wheel N⁵, having diametrically-opposite portions of its cog cut away, as shown in Fig. 13 of the drawings, forming a mutilated gear. The said cog-wheel N⁵ is so located that its cogs will intermittently intergear with a miter cog-wheel P³ on the end of a shaft Q³, journaled in pillow-block R⁵, secured to the table, extending longitudinally to the rear end of the machine, having attached to its rear extremity a knife S³ for the purpose of severing the continuous cigarette into suitable lengths as it emerges from the machine. At the right of the drawing-rollers is located a delivery guide-tube T³, having a flaring mouth at its forward end and terminating at its rear end at the rear end of the machine. The cog-wheel N⁵ is larger in diameter than the cog-wheel P³, so as to give such wheel P³ an accelerated motion in order that the knife may cut quickly at the proper moment to sever the cigarette. The knife is composed of two curved blades slotted at their shanks, the shank of one being shoul-

dered, so as to overset the shank of the other and permit the blades to move in the same circular plane. The slotted shanks set upon the projecting end of the driving-shaft Q³, which is squared to prevent them from turning on it, are confined by means of a clamp-nut V³, so that the blades may be adjusted when worn so as to deliver at all times a proper draw cut to cleanly sever the lengths from the continuous cigarette. This construction also permits the blades to be more readily removed for sharpening.

The letter W³ indicates the main shaft of the machine, which gives motion to the entire mechanism thereof. The said shaft extends longitudinally along the rear of the machine, having its bearings in pillow-blocks X³. (See Fig. 2 of the drawings.) The forward end of this shaft is provided with a miter-wheel W⁶, which intergears a similar wheel T on the oblique shaft R before mentioned. Said shaft R is provided with a grooved pulley Y³, from which passes a band Z³, Fig. 1, to one of the grooves on the cone-pulley N¹ of the pasting device hereinbefore described. The rear end of the driving-shaft W³ is provided with a beveled gear-wheel A⁴, which meshes with the beveled gear-wheel A⁵ on the shaft I¹, giving motion to the train of gearing driving the drawing-rollers and the cutting-knife. The main shaft (see Fig. 1) is provided with crank-arms B⁴, with which connect the pitmen C⁴, which are connected at their other ends to the cranks D⁴ on the axle of the fly-wheel E⁴, journaled in bearings in the standards F⁴, secured to the base G⁴, which is fastened to the base of the table or the floor of the room in which the machine is located. The cranks D⁴ are provided with treadles H⁴, by means of which the machine may be put in motion by the feet of the operator, who sits upon a suitable seat in front of the machine and watches the paper and tobacco as they pass by the scallops c⁹ in the former.

The operation of my invention will be readily understood in connection with the above description, and is as follows: The paper is fed in at the forward or left-hand end of the machine and is partly folded in the guide X, during which the tobacco is distributed on it from the hopper, being placed thereon by the distributing-fingers working in the distributing-chamber. The paper then passes to the former, where it is folded around the tobacco, its one side slightly projecting to pass over the pasting-disk. The paper then passes forward between the guide-rollers, receiving the paste from the paste-distributing disk in the meanwhile on the under side of the edge of the paper. The upper edge of the paper is pressed to the pasting-disk by the pressure-plate, after which the cigarette passes under the closer and pressure-roller, by means of which the overlapping-edges are united. The cigarette then passes through the drier and between the drawing-rollers, being finally

passed through the rear guide-tube and emerging at the rear end of the machine, where it is cut into proper lengths by the rotating knife, which makes one-half revolutions rapidly, remaining stationary until ready for another quick drawing-cut.

Instead of treadles a fast and loose pulley may be mounted upon the shaft and the shaft driven by a suitable belt extending from a proper driving-wheel.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The cutting knife, consisting of two blades having slotted shanks, in combination with the knife actuating shaft having a squared journal, over which the slotted shanks of the blades fit, and the clamping nut whereby the blades are adjustably secured to the shaft, substantially as specified.

2. The combination with split standards having adjusting bolts B¹, of a guide consisting of two flanges having their lower ends clamped in the said standards, each of the said flanges having its upper end concaved and bent inwardly to hold a paper ribbon, substantially as described.

3. The combination with a chamber having slots in the rear side thereof, a sliding rocker shaft, fingers projecting through the said slots and having their ends secured to the said shaft, an elbow lever having its lower end pivoted and its elbow pivoted to an arm projecting rearwardly from the said shaft, and a revoluble eccentric having a collar thereon secured to the rear end of the said elbow lever, substantially as described.

4. The combination with a chamber having slots in the rear side thereof, of slotted standards, a shaft mounted in the slots of the said standards, fingers projecting through the slots in the said chamber and having their ends secured to the said shaft, an elbow lever having its lower end pivoted and its elbow pivoted to an arm projecting rearwardly from the said shaft, and a revoluble eccentric having a collar thereon secured to the rear end of the said elbow lever, substantially as described.

5. The combination with a suitable curved guide having edges bent inwardly, of a former fitting thereto and having its one end corresponding in shape to the said guide and tapered therefrom to its opposite end at which point one edge thereof projects over the other and is bent back upon itself, the said guide having at an intermediate point scallops c⁹ below the level of the bent edges of the guide, substantially as described.

6. The combination with a disk having a perforated paste receptacle mounted thereon, and a liquid receptacle adapted to deliver its contents directly upon the said disk, substantially as described.

7. The combination with a disk having a perforated paste receptacle mounted thereon, a liquid receptacle adapted to deliver its contents directly upon the said disk, and a dis-

tributing roller bearing upon the said disk, substantially as described.

8. The combination with a driven transverse shaft having drawing rollers thereon, of a mutilated gear wheel mounted on the said shaft, and a longitudinal shaft having a knife blade thereon and having rigidly secured thereto a pinion engaging the mutilated gear

wheel upon the transverse shaft, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FLORANCE J. D. CHAPPELL.

Witnesses:

HATTIE J. SMITH,

W. CLARENCE DUVALL.