(No Model.) 4 Sheets—Sheet 1.

# O. W. ALLISON.

## CIGARETTE MACHINE.

No. 406,611. Patented July 9, 1889.

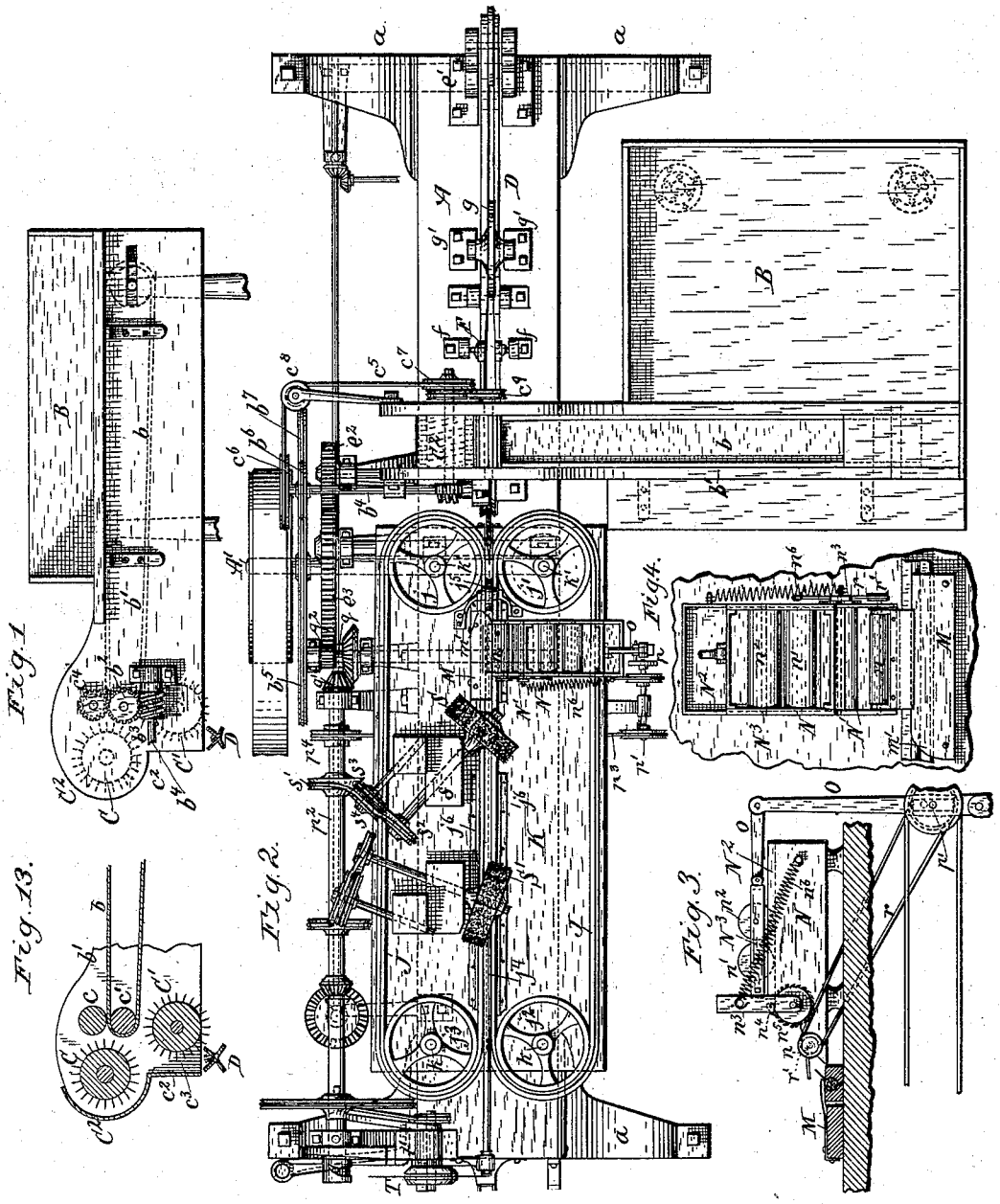


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. A.

WITNESSES:

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(No Model.) 4 Sheets—Sheet 2.

# O. W. ALLISON.

## CIGARETTE MACHINE.

No. 406,611. Patented July 9, 1889.

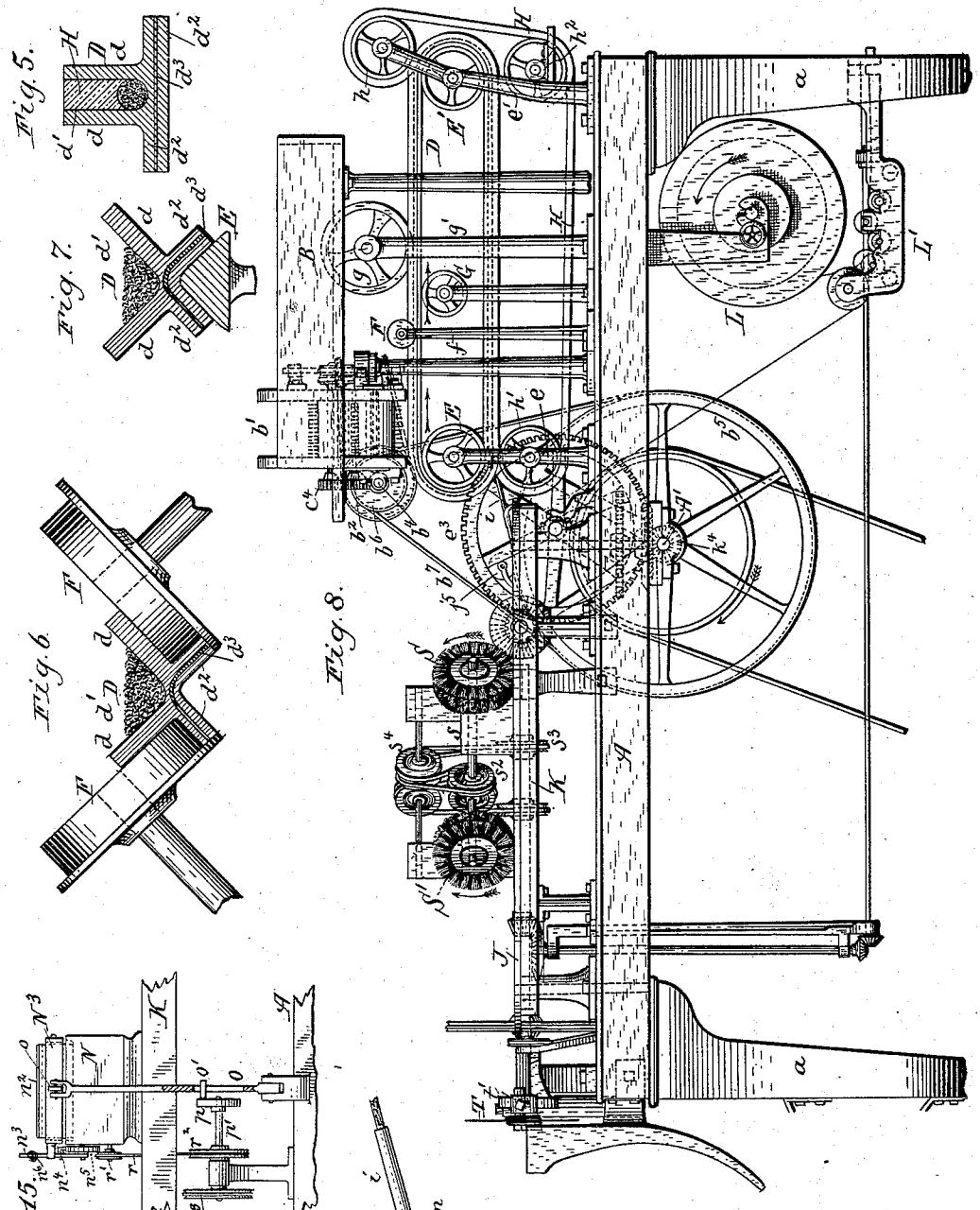


Fig. 8.



Fig. 5.



Fig. 7.



Fig. 6.



Fig. 15.

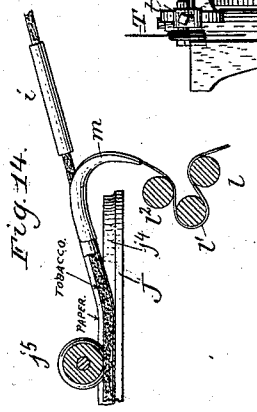


Fig. 14.

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(No Model.) 4 Sheets—Sheet 3.

# O. W. ALLISON.

## CIGARETTE MACHINE.

No. 406,611. Patented July 9, 1889.

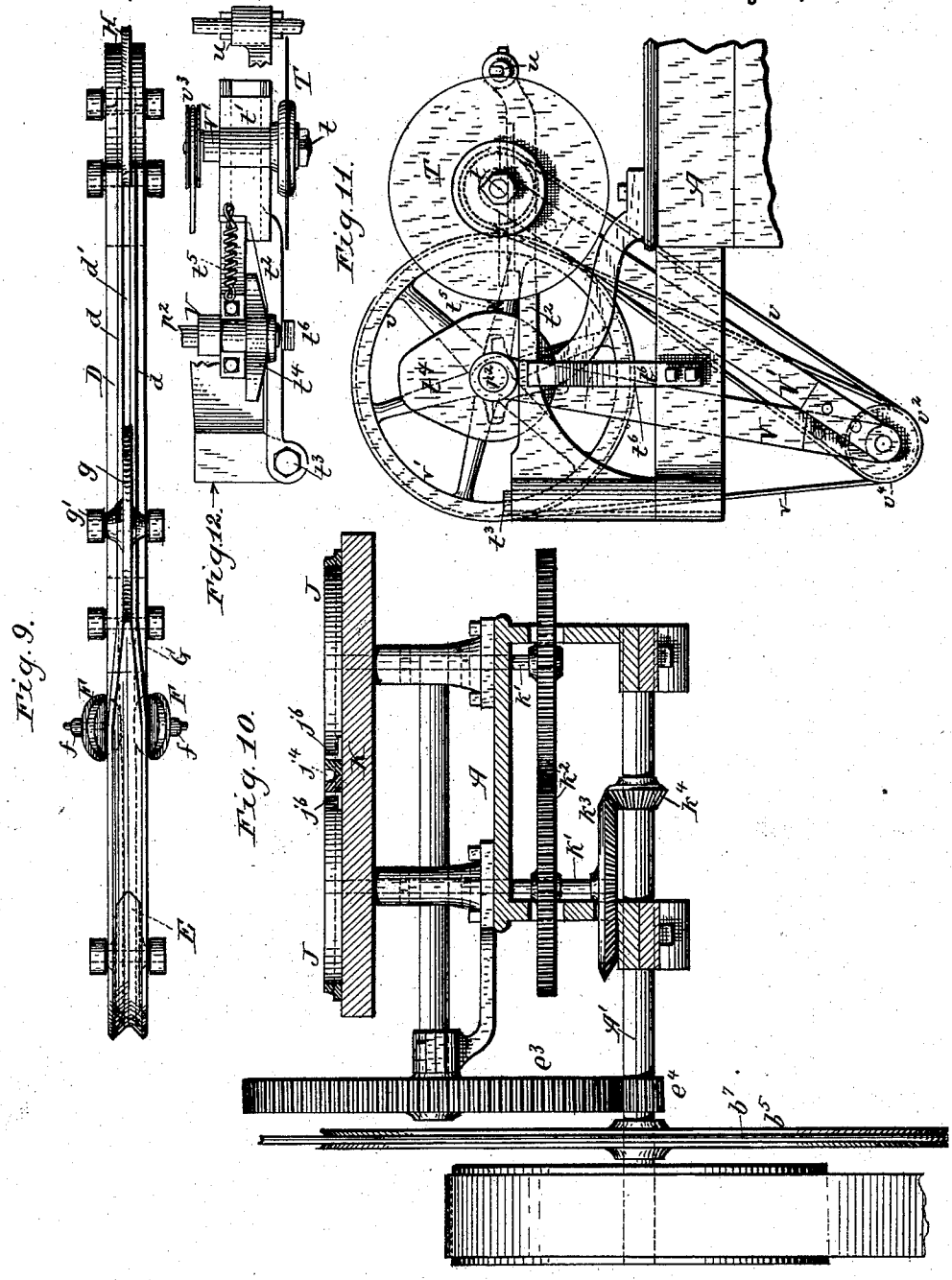


Fig. 9.

Fig. 11.

Fig. 10.

Fig. 11.

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(No Model.) 4 Sheets—Sheet 4.

# O. W. ALLISON.

## CIGARETTE MACHINE.

No. 406,611. Patented July 9, 1889.

Fig. 16.

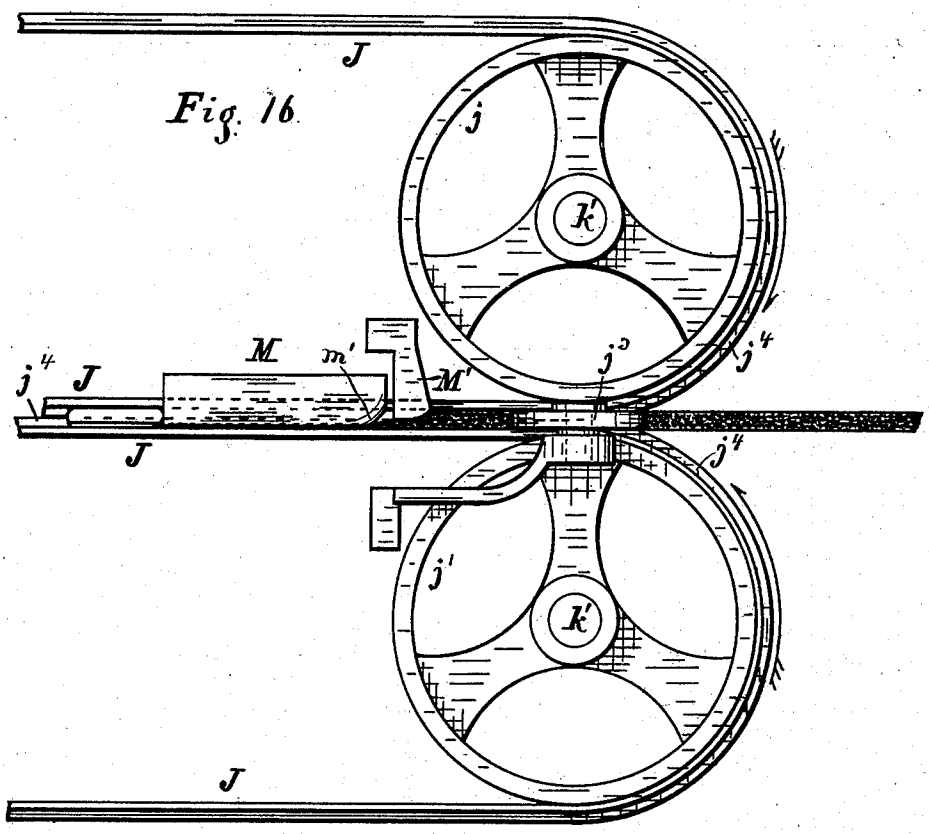
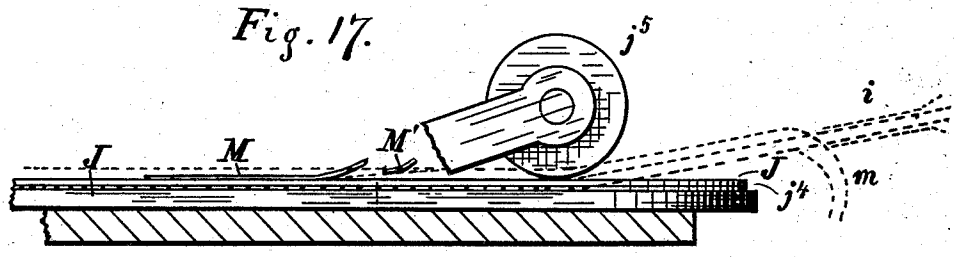



Fig. 17.




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# UNITED STATES PATENT OFFICE.

OSCAR W. ALLISON, OF ROCHESTER, NEW YORK.

## CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 406,611, dated July 9, 1889.

Application filed November 26, 1887. Serial No. 256,218. (No model.)

*To all whom it may concern:*

Be it known that I, OSCAR W. ALLISON, of the city of Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Cigarette-Machines, of which the following is a specification.

This invention relates to that class of cigarette-machines by which the tobacco is formed into a rod or bar around which is wrapped a strip or web of paper suitably pasted or gummed, which covered rod or bar is finally cut up into cigarettes of the desired length.

The object of my invention is to improve the various devices—such as the feeding, rod forming and compressing, paper folding and pasting, carrying and cutting devices—which enter into the organization of the machine.

The invention consists, to these ends, of the improvements, which will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, consisting of three sheets, Figure 1 is a front elevation of the feed mechanism. Fig. 2 is a top plan view of the machine. Fig. 3 is a side elevation of the pasting mechanism and connecting parts. Fig. 4 is a top plan view thereof. Fig. 5 is a cross-section of the grooved endless band which receives the tobacco and the compressing-band running in the same. Fig. 6 is a sectional elevation, on an enlarged scale, showing the receiving-band opened by the inclined pulleys preparatory to receiving the tobacco. Fig. 7 is a cross-section, showing the receiving-band opened by the wedge-faced wheel. Fig. 8 is a side elevation of the machine. Fig. 9 is a top plan view of the endless receiving-band and connecting parts. Fig. 10 is a cross-section of the drawing mechanism. Fig. 11 is a side elevation of the cutter mechanism. Fig. 12 is a top plan view of the same. Fig. 13 is a longitudinal vertical section of the picker mechanism. Fig. 14 is a longitudinal section of the paper-guiding mechanism. Fig. 15 represents an end view of the pasting mechanism. Figs. 16 and 17 represent the pressure-roller and drawing-belts, on an enlarged scale, in plan and side elevation.

Like letters of reference refer to like parts in the several figures.

A represents the horizontal bed or frame of the machine, which is supported by legs *a*, and A′ is the main driving-shaft journaled in bearings attached to said frame.

B is the feed-table upon which the tobacco is placed and which is arranged above the bed and on one side thereof in any suitable manner.

*b* represents the endless feed-apron arranged with its upper portion transversely on the table B and extending over the frame A.

*b′* represents the transverse trough or frame in which the feed-apron is arranged.

C is the horizontal picker-wheel or toothed cylinder arranged opposite the inner end of the feed-apron *b* and provided with suitable teeth which pick the tobacco off the end of said apron.

*c* is the pressure-roller bearing upon the apron *b* and the roller *c′*, around which it passes opposite the picker-cylinder C, and whereby the movement of the tobacco is retarded at the discharge end of the apron, so as to enable the picker-wheel to loosen and separate the shreds or strands of tobacco more effectually.

C′ represents a similar picker-wheel arranged below the picker C and receiving the tobacco from the latter. This lower picker-wheel serves to pick off any long strands of tobacco which are not detached by the upper picker-wheel. The picker-wheels C C′ are inclosed by a casing $C^2$, the vertical inner wall $c^2$ of which forms a throat $c^3$, in which the lower picker C′ is arranged. The latter contracts the throat $c^3$ and facilitates the delivery of the tobacco from the feeder, and removes any tobacco which may adhere to the lower returning portion of the feed-apron.

The roller *c′*, around which the feed-apron *b* runs, is provided with a gear-wheel $b^2$, which is driven by a worm $b^3$, mounted on a shaft $b^4$. The latter receives motion from a large pulley $b^5$, mounted on the main shaft A′, by a pulley $b^6$ and driving-belt $b^7$. The pressure-roller *c* is provided with a gear-wheel $c^4$, which meshes with the gear-wheel $b^2$. The shaft of the upper picker C is driven from the shaft $b^4$ by a belt $c^5$, running around pulleys $c^6$ $c^7$, and a guide-roller $c^8$. The lower picker-cylinder is driven from the upper picker-cylinder by a belt $c^9$.

D represents an endless grooved band, of rubber or other flexible material, which is arranged longitudinally over the main frame A and passes horizontally underneath the throat $c^3$ of the feed mechanism and receives the tobacco therefrom. The endless compressing-band D is provided with a longitudinal raised rib $d$, which is provided with a longitudinal groove $d'$. The receiving-band D runs underneath the feed mechanism around a pulley E, having a wedge-shaped face. As the band passes over this pulley, its base-flanges $d^2$ are drawn downwardly over the wedge on the face of the pulley, whereby the groove in the band is distended, as represented in Figs. 6 and 7, and enabled to receive the tobacco.

F F represent two inclined flat-faced pulleys arranged on opposite sides of the endless band D, rearwardly of the pulley E, and bearing against the upper sides of the base-flanges $d^2$ of the band. The pulleys F F serve to hold the band in an open or distended position in rear of the pulley E, and they are arranged at such a distance from the pulley E as to keep open a portion of the groove $d'$ about equal to the width of the feed-throat $c^3$. The tobacco is fed into the groove of the band by the picker-wheel C′ as the band passes under the throat $c^3$ in this open condition. The inclined pulleys F F are mounted at the upper ends of standards $f f$.

G represents a flat-faced roller, which bears against the under side of the grooved band in rear of the inclined rollers F F. As the band passes over the straight-faced roller G, its base-flanges $d^2$ are straightened or caused to assume their normal position and the sides of the groove $d'$ are thereby caused to approach each other and assume their former parallel position, thereby contracting the groove $d'$ to its original or normal size. This contraction or straightening of the band compacts the tobacco in a measure.

$g$ is a compressor-wheel arranged in rear of the roller G, and has a concave face which runs in the groove $d'$ of the band D, as represented in Figs. 8 and 9, whereby the tobacco is further compacted in the groove of the band. The compressor-wheel $g$ is journaled in the upper end of supports or columns $g'$. The receiving-band D runs around a flat-faced pulley E′, arranged over the front end of the main frame A. The pulley E is journaled in the upper ends of standards $e$, and the wheel E′ is mounted in standards $e'$. The shaft of the pulley E is provided with a gear-pinion $e^2$, which meshes with a gear-wheel $e^3$, and the latter in turn engages with a pinion $e^4$, Fig. 10, secured to the main driving-shaft A′. In this manner the compressing-band D is driven from the main shaft. The base portion $d^2$ of the band D is preferably stiffened by a layer of canvas or other fabric $d^3$, as represented in Figs. 5, 6, and 7. The partially-compacted rod of tobacco is now carried along by the endless band D, and is further compacted by an endless pressure-band H, which runs around suitable pulleys $h\ h'\ h^2$. The band H runs in the groove $d'$ of the band D at the point where the latter runs around the pulley E′, and also along the under side of the band D to the pulley $h'$, where it leaves the band D and runs around the pulley $h^2$, thence back to the pulley $h$, as represented in Fig. 8. In passing around the pulley E′ outside of band D the band H is tightly drawn into the groove of the band D, and exerts a sufficient pressure upon the tobacco in the groove to compact the same into a round or cylindrical rod. The inner face of the band H is made concave and the bottom of the groove $d'$ in the band D is also made concave, so that the depression of the compressing-band H and the groove in the band D together form a cylindrical mold, as represented in Fig. 5. The compressing-band H is driven by frictional contact with the band D. The rod of tobacco issues from the compressing-bands D H, beyond the pulleys $h'$ and E, and is guided by a downwardly-inclined trough or chute $i$ to the drawing mechanism. The end of the chute $i$, which receives the tobacco rod or filler, is preferably flared outward to facilitate the entrance of the rod, as indicated in Fig. 17. This drawing mechanism consists of two endless horizontal drawing belts or bands J J, which are arranged side by side upon a supplementary table K, supported above the bed A, and which run around suitable pulleys $j\ j'\ j^2\ j^3$. The belts J J are grooved or recessed in their outer faces, so that the inner portions of the two belts, which run in contact with each other, will form a longitudinal groove $j^4$, open at the top, which receives the rod of tobacco and the paper wrapper inclosing the same.

$j^5$ represents a pressure-roller, whereby the rod of tobacco is held down in the groove $j^4$ as it comes from the chute $i$. The roller $j^5$ is supported in any suitable manner, so that its lower side bears on the tobacco-rod passing beneath it, being located a short distance behind the point where the belts J J meet, as indicated in Fig. 2, or, preferably, with its center immediately above such point, as represented in Fig. 17. The lower side of the roller passes between the edges of the paper, one of which is folded down by the folder M and the other by the brush S. The operation of the folder M may be assisted by a finger M′, which partially folds down the edge of the paper before it arrives at folder M.

$j^6$ represents two longitudinal angle irons or strips, which are secured to the top of the supplementary table K and bear against the outer sides of the contiguous portions of the grooved belts J J, so as to prevent the same from yielding laterally under the pressure of the continuous cigarette moving between said belts.

The pulleys $j\ j'\ j^2\ j^3$, around which the bands J J run, are mounted upon vertical shafts $k\ k'$, and the shafts $k'$ are provided

with gear-wheels $k^2$ $k^2$, meshing with each other. One of the shafts $k'$ is provided with a bevel-wheel $k^3$, which meshes with a bevel-pinion $k^4$, secured to the main driving-shaft A'.

By constructing the driving mechanism as above described the groove between the two drawing-belts is divided into two parts which approach each other at the receiving end of the groove and form a converging space whereby the entrance of the rod of tobacco into the groove is facilitated, and the discharge of the rod from the groove is likewise facilitated by the two parts of the groove receding from each other at the delivery end of the drawing mechanism.

Heretofore it has been proposed to use printing devices for forming an imprint on the paper wrapper of the cigarette; but this has proved impracticable, because the drawing devices heretofore used were not sufficiently positive in their operation and would allow the cigarette to slip and cause the imprint to get out of register with the cutter mechanism, thereby frequently cutting the imprint in two. My improved drawing mechanism is sufficiently positive in its action to prevent the slipping of the cigarette and thereby overcomes this objection.

L represents a drum arranged below the bed A and upon which the web of paper is wound. From the drum L the paper passes through a printing mechanism L', of any suitable construction, whereby a suitable imprint is formed upon the paper, such as a trade-mark or the name of the manufacturer. The web of paper thence passes upwardly around three guide-rollers $l$ $l'$ $l^2$, which hold the paper against lateral displacement and present it properly to the folding mechanism arranged upon the supplementary table K, near the front portions of the drawing-belts J J. This folding mechanism may be of any suitable or well-known construction, but is preferably composed of a curved concave guide $m$ and a folding-plate M. The guide $m$ conducts the web of paper into the groove $j^4$, between the drawing-belts J J, and the trough or chute $i$ conducts the rod of tobacco into said groove upon the web of paper. The folding-plate M is arranged above the front portion of the drawing-belts J J, in rear of the pressure-roller $j^5$, and is provided with a curved or inclined front edge $m'$, which folds one of the projecting flaps of the paper down upon the rod of tobacco, as represented in Figs. 3 and 16.

$n$ represents a rotating wiper or brush arranged opposite the folder-plate M, and whereby paste is applied to the other projecting flap of the paper. The wiper $n$ is mounted in the front end of a casing N and receives the paste from a roller or wheel N', arranged behind the wiper and also mounted in the casing N, as represented in Figs. 2, 3, and 4. The paste is placed upon a table $N^2$, secured to the casing N, and is ground upon said table by two rollers $n'$ $n^2$, which are mounted in a reciprocating frame $N^3$. The roller $n'$ rests upon the paste-wheel N', when the reciprocating frame $N^3$ has moved inward and supplies the latter with paste from the table $N^2$. The reciprocating frame $N^3$ is actuated by a rock-arm O and a rod $o$, and the rock-arm O is actuated in turn by a pin $o'$, secured to a pulley $p$ and engaging in a slot in the rock-arm. The pulley $p$ is mounted upon a horizontal shaft $p'$, and is rotated from a horizontal counter-shaft $p^2$ by a belt $p^3$ and a pulley $p^4$, mounted on the shaft $p^2$. The latter receives motion from a short shaft $q$, by means of bevel-wheels $q'$, and the shaft $q$ in turn is rotated from the gear-wheel $e^3$ by a pinion $q^2$, meshing with the latter. The paste-wheel N' receives an intermittent rotary motion by means of a pivoted arm $n^3$, which rests loosely against the front end of the reciprocating frame $N^3$, and a pawl $n^4$, pivoted to the rock-arm $n^3$, engaging with the ratchet-wheel $n^5$, secured to the wheel N'. $n^6$ is a spring secured with one end to the arm $n^3$ and with its other end to the casing N, and whereby the arm $n^3$ is drawn backwardly at the backward stroke of the reciprocating frame. By this means the paste-wheel N' is intermittingly rotated, whereby fresh portions of the wheel are constantly presented to the rotary wiper $n$. The latter receives motion from the shaft $p'$ by an endless belt $r$, running around pulleys $r'$ $r^2$, mounted respectively upon the shaft of the wiper and the shaft $p'$. The wiper $n$ is flexible, and it comes in contact with the roller N' at each revolution, receiving the paste therefrom and transferring it to the edge of the paper.

S represents a rotating brush arranged obliquely in rear of the folding and pasting mechanism, and whereby the pasted flap of paper is laid down upon the flap which has been previously folded down upon the rod of tobacco. The rotating brush is mounted in suitable bearings formed in a standard $s$, and is driven from the shaft $p^2$ by an endless belt $s'$, running around pulleys $s^2$ $s^3$, mounted on the shaft of the brush and the shaft $p^2$, and the guide-wheel $s^4$. S' represents a similar rotating brush arranged in rear of the brush S, and whereby any wrinkles which may occur in the folded and pasted paper are smoothed out. The brush S' is rotated from the shaft $p^2$ in a manner similar to the brush S.

T represents a rotating cutter-disk to which the continuous cigarette is carried by the drawing mechanism, and whereby the cigarette is cut into suitable lengths. This cutter-disk is supported in such manner that it can be moved toward and from the continuous cigarette, and at the same time in the direction in which the cigarette moves. The mandrel $t$ of the cutter-disk T is mounted in a sliding carriage $t'$, which moves in longitudinal ways formed on an arm $t^2$. The latter is mounted upon a vertical pivot $t^3$, secured to the frame of the machine, so that the arm, with the cutter-disk, can swing upon said pivot

in the direction in which the endless cigarette moves.

$t^4$ represents a rotating cam mounted upon the shaft $p^2$, and which bears against the carriage $t'$ and moves the latter forwardly and the cutter-disk across the path of the cigarette, so as to cut the same. After the cut has been effected the cutter-carriage $t'$ is returned to its former position by a spring $t^5$. The side of the cam $t^4$ adjacent to the arm $t^2$ is inclined, as shown in Fig. 12, so as to move the arm and cutter-disk in the direction in which the cigarette moves simultaneously with the forward movement of the cutter-carriage. The inclination of the side of the rotating cam is such as to cause the cutter-disk to move with the same speed as the cigarette, and thereby effect a perfect cut. The swinging arm $t^2$ is returned to its former position, preparatory to forming a new cut, by a flat spring $t^6$, secured to the frame of the machine and bearing with its upper end against the arm $t^2$.

$u$ represents a die arranged at the inner end of the arm $t^2$, and through which the endless cigarette moves, and across which the cutter-disk passes in producing the cut. The cutter-disk is rotated by means of a belt $v$, passing around a pulley $v'$, arranged on the shaft $p^2$, thence around a pulley $v^2$, mounted in the lower end of an arm V, thence upwardly to a pulley $v^3$, mounted on the mandrel $t$ of the cutter-disk, thence downwardly to another pulley $v^4$, arranged on one side of the pulley $v^2$, and thence back to the pulley $v'$. The arm V is mounted loosely with its upper end upon the shaft $p^2$, and its lower end is connected with the mandrel of the cutter-disk by an arm V', so that the pulleys $v^2$ and $v^4$ and belt $v$ can take part in the reciprocating movements of the cutter-disk and rotate the same continuously.

It is obvious that the tobacco-feeding mechanism for cigarette-machines herein described, by which the tobacco is delivered in a continuous manner in a condition for the production of a compacted tobacco-filler, may be employed in connection with any other suitable filler-forming devices or any suitable mechanism adapted to inclose and seal the filler within a paper wrapper.

No claim is made in this application to anything shown, described, or claimed in my application, Serial No. 182,362, filed November 10, 1885.

I claim as my invention—

1. The combination, with the endless carrying-apron $b$, supported at its delivery end by roller $c'$, and the pressure-roller $c$, arranged over the delivery end of the apron, of the inclosing-casing $C^2$, provided with discharge-throat $c^3$, the upper picker-wheel C, arranged at the delivery end of the carrying-apron, and a picker-wheel C', arranged in the throat $c^3$, below the picker-wheel, and the carrying-apron $b$, substantially as set forth.

2. The tobacco-feeding mechanism, consisting, essentially, of the endless tobacco-carrying apron $b$, supported by roll $c'$ at its delivery end, the pressure-roller $c$, arranged over the delivery end of the apron, the inclosing-casing $C^2$, provided with discharge-throat $c^3$, the upper picker-wheel C, arranged at the delivery end of the carrying-apron, a picker-wheel C', arranged in the throat $c^3$, below the picker-wheel, and the carrying-apron $b$, in combination with a grooved and flexible band D, substantially as described.

3. The combination, with the tobacco-feeding mechanism, of a traveling endless flexible receiving-band provided with a continuous longitudinal groove which receives the loose tobacco from the feeding mechanism, a wedge-faced wheel over which said band passes and whereby its groove is distended, inclined rollers or wheels arranged on opposite sides of said band and bearing against the base portions thereof, whereby the groove is held distended, and flat-faced rollers, whereby the band is returned to its normal condition, substantially as set forth.

4. The combination, with the tobacco-feeding mechanism, of the traveling endless flexible receiving-band D, provided with a continuous longitudinal raised rib $d$, having continuous groove $d'$ and base-flanges $d^2$ $d^2$, and rollers so constructed as to distend the groove and then return it to its normal condition, substantially as described.

5. The combination, with the tobacco-feeding mechanism, of the traveling endless flexible receiving-band D, provided with the continuous longitudinal raised rib $d$, having continuous groove $d'$ and base-flanges $d^2$ $d^2$, suitable rollers for carrying the band, so constructed as to distend the groove in the rib and then return it to its normal condition, and the endless flexible compressing-band H, running in the groove of the receiving-band, substantially as described.

6. The combination, with the tobacco-feeding mechanism, of the traveling endless flexible receiving-band D, provided with a continuous longitudinal raised rib $d$, having continuous groove $d'$ and base-flanges $d^2$ $d^2$, suitable rollers for carrying the band, so constructed as to distend the groove in the rib, the compressor-wheel $g$, operating to compress the tobacco in the groove, and the endless flexible compressing-band H, running in the groove, substantially as described.

7. The combination, with the feeding mechanism, of an endless flexible receiving-band provided with a continuous longitudinal groove which receives the loose tobacco from the feeding mechanism, pulleys whereby the groove of said band is distended and returned to its normal condition, and an endless compressing-band which runs in the groove of the receiving-band after the latter has been returned to its normal condition, substantially as set forth.

8. In a cigarette-machine, the herein-described mechanism for drawing the cigarette-rod, consisting of the horizontally-arranged

endless flexible bands J J, running face to face around pulleys on a suitable support, each band being provided at its upper corner with a continuous longitudinal recess, the two recesses forming the groove $j^4$ for receiving the cigarette-rod, substantially as described.

9. The combination, in a cigarette-machine, of mechanism for drawing the cigarette-rod, consisting of the horizontally-arranged endless flexible bands J J, running face to face around pulleys on a suitable support, each band being provided at its upper corner with a continuous longitudinal recess, the two recesses forming the groove $j^4$ for receiving the cigarette-rod, and the pressure-roller $j^5$, arranged over said groove, whereby the tobacco-filler is held down in the groove at or near the meeting-point of the bands, substantially as described.

10. The combination, in a cigarette-machine, of mechanism for drawing the cigarette-rod, consisting of the horizontally-arranged flexible bands J J, running face to face around pulleys on a suitable support, each band being provided at its upper corner with a continuous longitudinal recess, the two recesses forming groove $j^4$ for receiving the cigarette-rod, the pressure-roller $j^5$, arranged over said groove, whereby the tobacco-filler is held down in the groove, and the paper-folder M and rotating paper-folding brush S, also arranged over the groove, substantially as described.

11. The combination, with the paste-table and a reciprocating frame, of paste-grinding rollers mounted in said frame, a wiper, and a paste-roller, whereby the paste is applied to the wiper, substantially as set forth.

12. The combination, with the paste-table and the grinding-rollers, of a reciprocating frame in which said rollers are mounted, a rock-arm whereby said frame is actuated, a rotary wiper, a paste-roller whereby the paste is applied to said wiper, and a pawl-and-ratchet mechanism connected with said reciprocating frame, whereby an intermittent rotary movement is imparted to said paste-roller, substantially as set forth.

Witness my hand this 17th day of November, 1887.

OSCAR W. ALLISON.

Witnesses:
JNO. J. BONNER,
FRED. C. GEYER.