

(No Model.)

5 Sheets—Sheet 1.

W. C. BRIGGS.
CIGARETTE MACHINE.

No. 553,507.

Patented Jan. 28, 1896.

Fig. 1

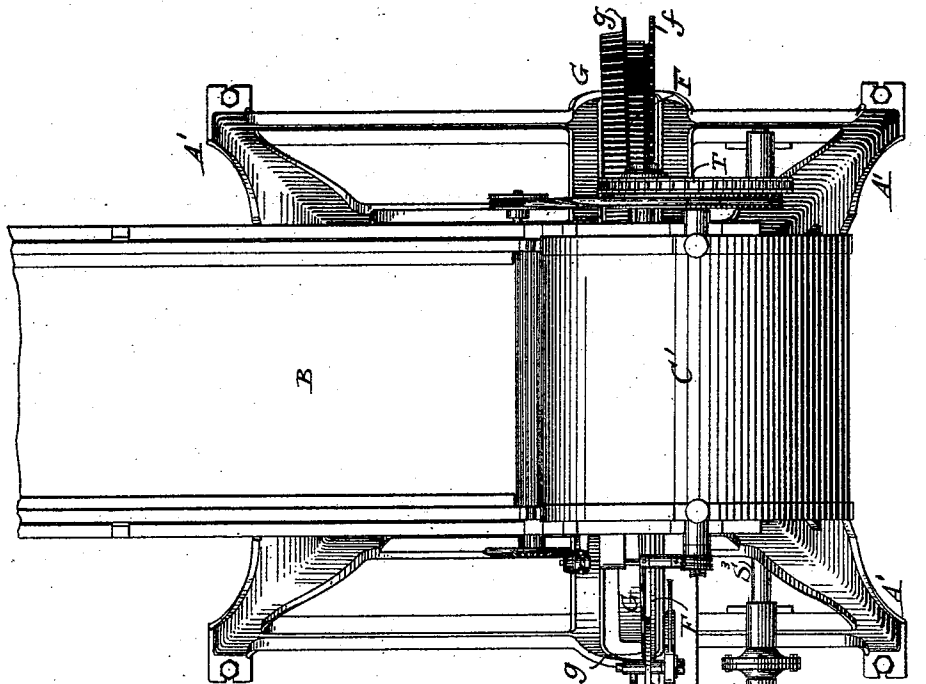


Fig. 11.

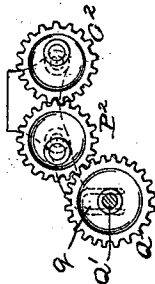


Fig. 12.

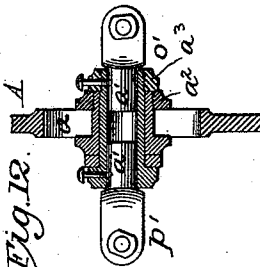
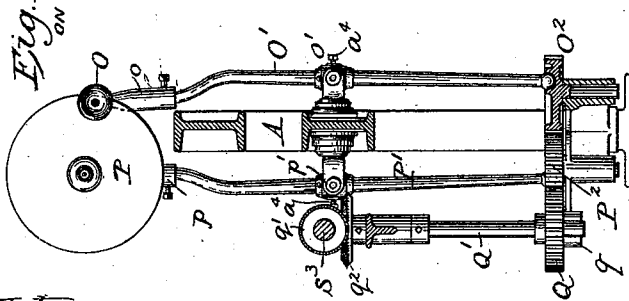


Fig. 10

ON 10-10



Witnesses

Sidney P. Hoenigsworth
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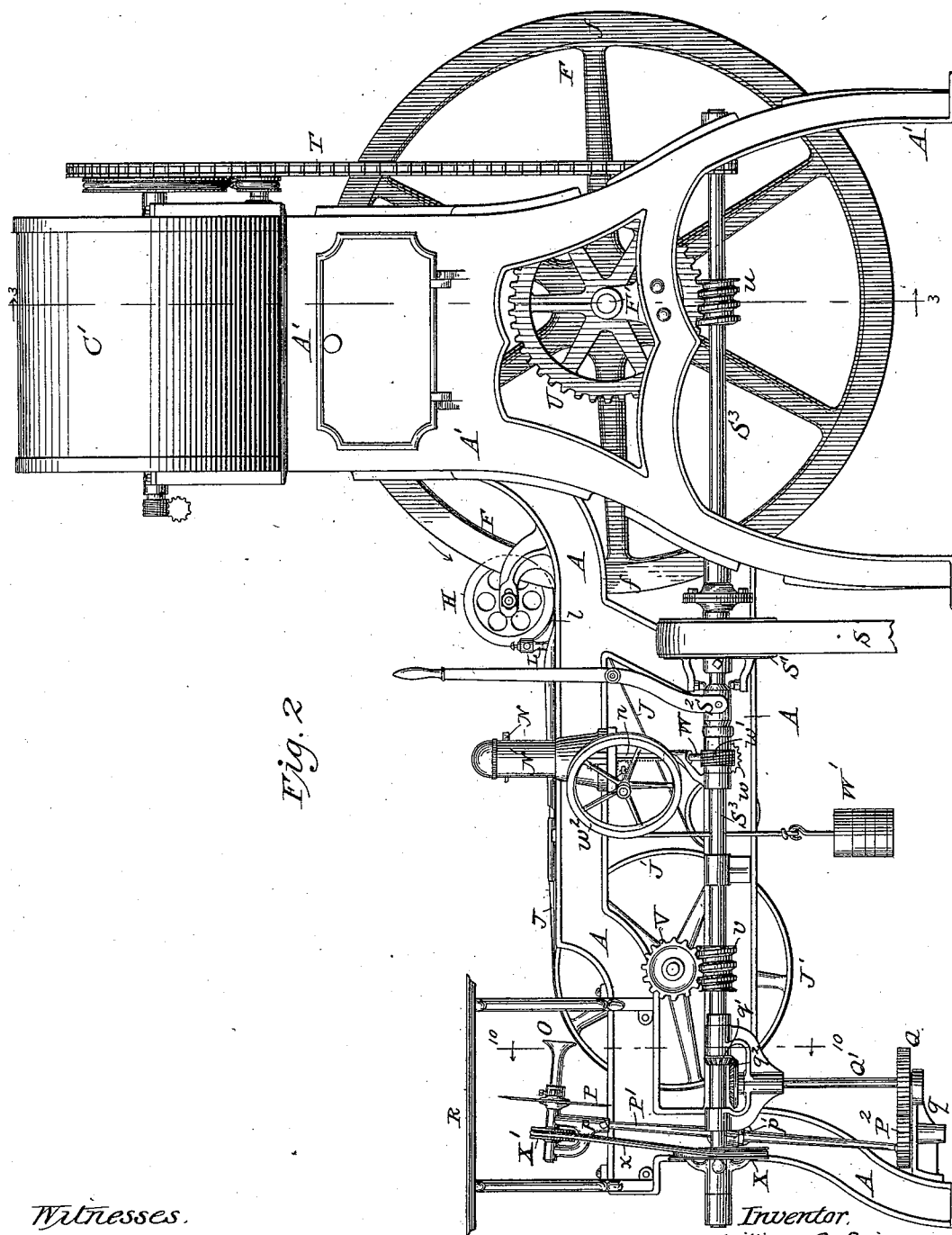


Fig. 2

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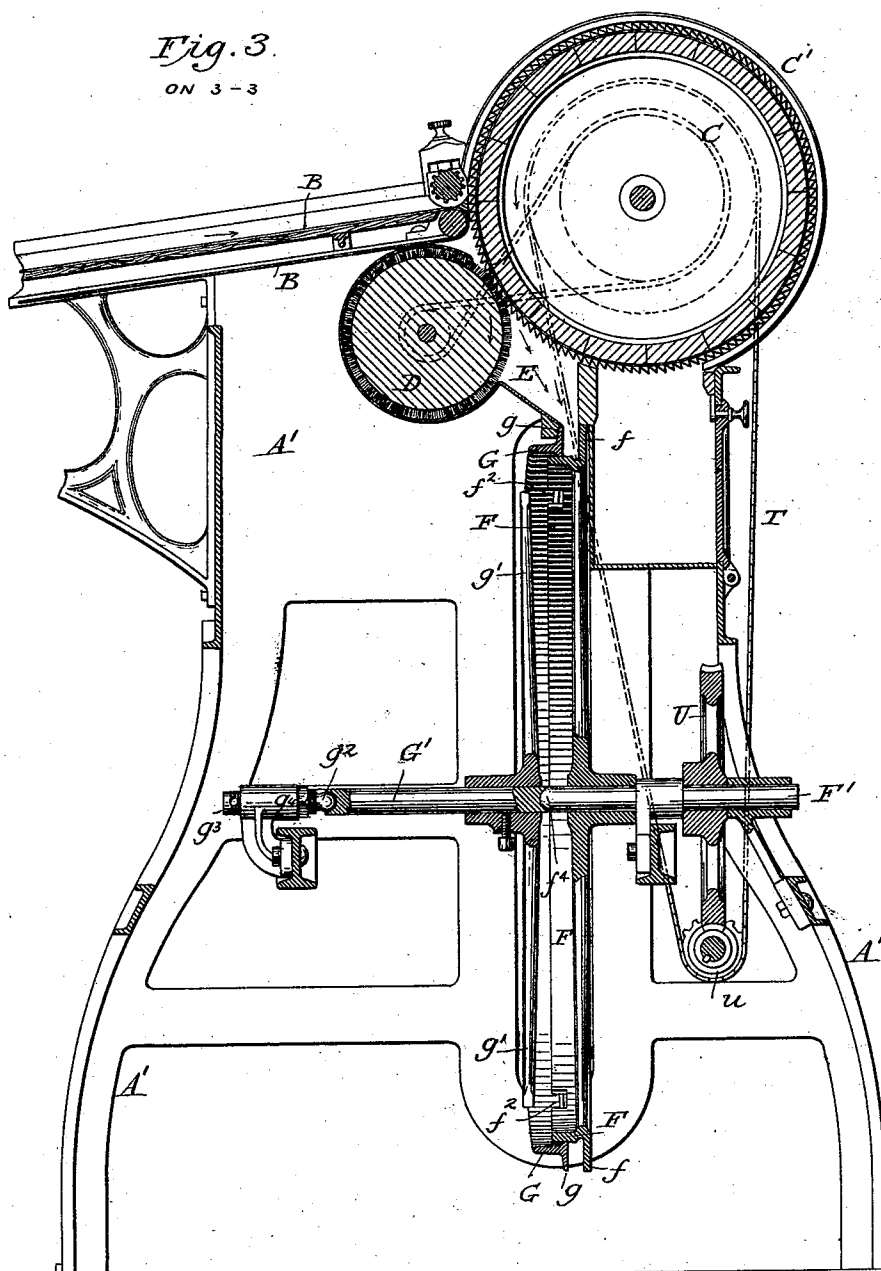
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Fig. 3.

ON 3-3



Witnesses

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(No Model.)

5 Sheets—Sheet 4.

W. C. BRIGGS.
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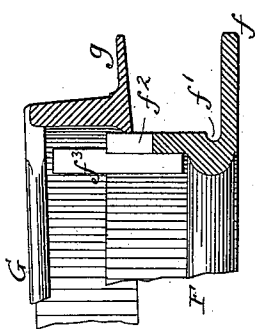


Fig. 5

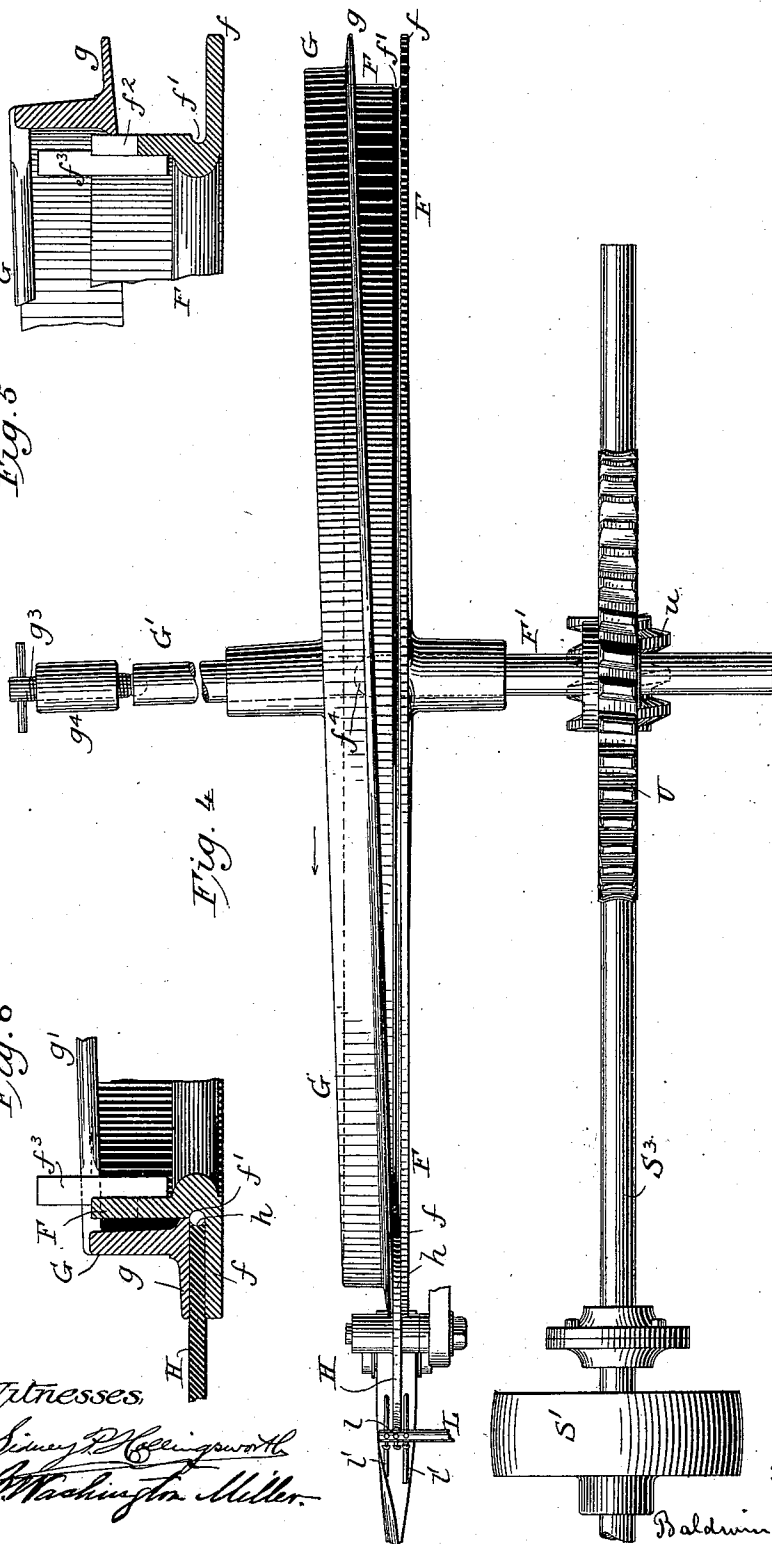


Fig. 4

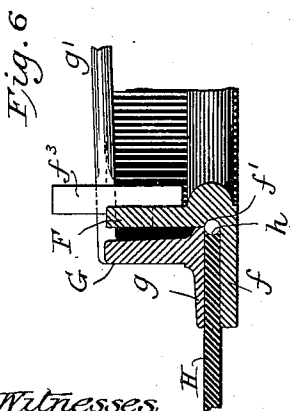


Fig. 6

Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM C. BRIGGS, OF WINSTON, NORTH CAROLINA, ASSIGNOR TO THE
WINSTON CIGARETTE MACHINE COMPANY, OF SAME PLACE.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,507, dated January 28, 1896.

Application filed April 26, 1895. Serial No. 547,228. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. BRIGGS, a citizen of the United States, residing at Winston, in the county of Forsyth and State of North Carolina, have invented certain new and useful Improvements in Cigarette-Machines, of which the following is a specification.

My invention relates to what is known in the art as the "continuous-filler" class of cigarette-machines, in which loose fibrous tobacco is automatically fed into the machine, formed into a continuous filler-rod, and inclosed in a continuous wrapper which is folded around the filler-rod, pasted and then sealed, forming a continuous cigarette, and then cut into smokable lengths by automatic cutting mechanism.

My present invention contemplates the production of a continuous cigarette by the performance of these operations in a simple and effective manner by certain novel combinations, constructions and organizations of instrumentalities which are hereinafter particularly designated.

The best way now known to me of carrying out the objects of my invention is to feed the tobacco to rollers or brushes, between which it is passed, and which deliver it in regulated quantities directly upon the grooved flanged periphery of a main carrying-wheel, which co-operates with another flanged carrying-wheel, the two wheels being so organized as to cause their flanges gradually to converge from the feed to the discharge end, so as to compress the tobacco laterally and cause it to pass beneath a wheel or roller, the periphery of which is grooved correspondingly with the main carrying-wheel so as to compress the tobacco into circular shape, form it into a filler-rod of uniform dimensions, and deliver it upon a paper strip, which is carried by an endless belt through suitable folding or wrapping mechanism to a suitable pasting and sealing device, and thence to the cutting devices.

The accompanying drawings show so much mechanism embodying the improvements herein claimed as is necessary to illustrate my invention as adapted to a machine substantially resembling, in many respects, that shown in Letters Patent No. 512,151, granted

to me January 2, 1894. Some of said improvements, however, may be used without the others, and in machines differing somewhat in their details of construction from that herein shown. Unless otherwise indicated the parts are supposed to be of usual approved construction.

My invention contemplates the adaptation of my improvements to the best machines of the present day.

The feed end of the machine I term the "front," and the discharge end the "rear." That side of the machine on the right of one adjacent to and facing the front I term the "right," the opposite side the "left." In this instance the right side of the machine is that on which the operator stands.

Figure 1 is a plan or top view of the entire machine. Fig. 2 is a left-side view thereof in elevation, or an elevation of that side opposite the operator; Fig. 3, a vertical transverse section on the line 3 3 of Fig. 2, looking toward the front or feed end of the machine, showing the tobacco feeding and carrying mechanism. Figs. 4, 5, and 6 are on an enlarged scale. Fig. 4 is a plan or top view of the filler forming and carrying wheels and a portion of their driving-gearing. Fig. 5 represents a plan view, partly in horizontal section, through the feed side of the filler-carrying wheels, showing their relation at that point. Fig. 6 represents a similar view in section through said wheels and the compressing-wheel at the opposite or delivery side of the carrying-wheels, showing their relation at this point and the mode of insuring uniform speed between the filler-carrying wheels. Fig. 7 represents a similar detail view of the filler-carrying wheels and a guard or conductor adjacent thereto. Fig. 8 represents a right-side elevation of the filler forming, wrapping, pasting, and sealing mechanism on that side of the machine next the operator. Fig. 9 represents a transverse section through the devices for regulating the tension upon the paper-wrapper strip. Fig. 10 shows the cutting mechanism, partly in elevation and partly in vertical transverse section, on the line 10 10 of Fig. 2, looking toward the discharge end of the machine; Fig. 11, a plan view of the cutter-actuating

gears; and Fig. 12 a detail view in section of the central bearings of the carrying-arms, which support the cutter-disk and the discharge-tube.

5 Arrows indicate the direction in which the various parts of the machine move.

The salient features will first be described, successively, from the feed to the discharge end, then the actuating mechanism, and
10 finally the operation.

The mechanism is shown as mounted on a main frame A, from the front end of which extends a feed-supporting frame A', over which traverses a feed-apron B, which terminates near a carding-cylinder or feed-roller
15 C, rotating within a casing C'. A cylindrical brush or feed-roller D, rotating in contact with the teeth of the carding-cylinder and at a higher rate of speed, discharges the tobacco into a hopper E. These parts just
20 described resemble those shown in my patent above mentioned.

The tobacco falls through the open bottom of the hopper upon the periphery of the main
25 carrying-wheel F, provided with a vertical flange *f* on the left-hand side of its periphery and with a peripheral semicircular groove *f'* at or near the junction of the flange with the rim of the wheel. A second carrying-wheel
30 or ring G carries upon its inner or left-hand peripheral edge a vertical flange *g*. The periphery or rim of this last-mentioned wheel projects on one side in such manner as to overlap or encircle the periphery of the main
35 carrying-wheel F, the two wheels being concentric and revolving concentrically on coincident axes. Their speed of rotation is made uniform by forming slots or recesses *f*² in the wheel F, which interlock with the spokes *g'*
40 of the wheel or ring G. The wheels are further locked together by means of lugs or studs *f*³, projecting from the wheel F, and which abut against the spokes of the ring or wheel G. The interlocking devices are detachable
45 or separable and come into play only on the converging side of the wheels, being disconnected by the divergence of the wheels at the feed end, this connection and disconnection being constantly repeated during the rotation
50 of the wheels, by which means the ring or wheel G is driven from the wheel F and their uniform rotation is secured. The axes of the flanged wheel F and the flanged ring or wheel G are arranged in the same horizontal plane,
55 but at a slight angle to each other, so that the recess or trough formed by their flanges tapers from the feed to the discharge side.

The shaft F' of the wheel F is mounted in fixed bearings in the frame, its inner end being rounded at *f*⁴, as shown in Fig. 3, and interlocking with the correspondingly-recessed
60 end of the shaft G' of the wheel or ring G. The opposite end of the shaft G' is connected by a ball-and-socket joint *g*² with a screw-shaft *g*³, supported in a bracket *g*⁴ on the main frame, by which means the wheel G can be adjusted relatively to the wheel F.

A compressing-wheel H, provided with a semicircular peripheral edge *h* and mounted in suitable bearings on the frame, runs between the flanges *f* *g* of the main carrying-wheel F and flanged ring or wheel G, at or near their point of closest approximation, on their discharge side. The tobacco is compressed into a cylindrical or rod-like form by
75 means of the corresponding grooves in the carrying-wheel F and compressing-wheel H.

The front end of a guard-plate I abuts against the flanges *f* and *g* of the filler-carrying wheels F and G, as shown in Fig. 7, while its protruding tongue *i* passes between said
80 flanges and into the annular groove *f'*, thus serving to prevent the escape of any loose fibers of tobacco at that point. This guard encircles the lower part of the compressing-wheel H and extends to the point where the carrying-belt J and overlying paper-wrapper
85 strip *k*, carried thereby, pass over a small roller *j* to the wrapping devices, thus serving as a guide or conductor to deliver the formed
90 filler upon the paper-wrapper strip.

An endless belt J passes around a large flat-faced driving-wheel J', over a guide-pulley J², through an adjustable guide J³, around a small roller *j*, and through the wrapping
95 devices. The roller *j* is mounted in a bracket *j'*, adjustable by means of a slot and set-screw *j*², so as to regulate the tension of the belt.

The paper-roll is mounted on a shaft K, and upon its periphery bears the lower or
100 outer end of a plate-spring K', which carries guide-pins *k'* on each side of the paper-roll to maintain the spring in proper position. The upper or inner end of the plate-spring K' is secured to a sleeve *k*², turning on a fixed
105 stud-axle K². A spiral spring *k*³ is secured at one end to a sleeve *k*⁵, while the other end bears against the plate-spring K'. The tension of the spring is regulated by turning the sleeve *k*⁵ upon the fixed stud-axle K² and
110 locking it in position by a set-screw *k*⁴. The pressure of the plate-spring is thus regulated by the tension on the spiral spring. The strip of paper *k* traverses the plate-spring, which acts as a guide therefor, while also
115 acting as a pressure device upon the roll of paper.

A doctor or scraper *l*, mounted on a supporting-frame L, projects into the groove of the compressing-wheel H to clear it of any
120 adhering tobacco. Yielding guide-rods *l'*, mounted on the frame L, on opposite sides of the roll H, bear upon the paper strip near its opposite edges as it enters the wrapper-guide M and retain it in proper position.
125

Any preferred form of folding, wrapping, and pasting devices may be employed—such, for instance, as those which are shown in my Letters Patent No. 512,151, above mentioned. The construction and operation of these parts
130 being well understood need not be described in detail.

The completed cigarette is delivered by the belt into a flaring-mouthed discharge-tube O,

carried by a sleeve *o*, vertically adjustable upon an arm *O'*, rocking centrally in swivel-bearings *o'* on the frame. The lower end of this rocking arm is connected eccentrically by a ball-and-socket joint with a spur-gear *O*², which meshes with a corresponding gear *P*², driven by another spur-gear *Q*. This last-named spur-gear is connected with an upright shaft *Q'*, the lower end of which turns in a fork *q'* on the same supporting-bracket that carries the gears *P*² and *O*². This arrangement permits the shaft *Q'* to be adjusted nearer to or farther from the gear *P*², so as to admit of the use of a gear of larger or smaller size than the gear *Q* to vary the speed of the cutters.

The cutting-disk *P* is carried by a sleeve *p*, adjustable vertically upon an arm *P'*, rocking upon a pivot *p'*, and eccentrically connected at its lower end to the spur-gear *P*² above mentioned.

The bearings *o'* and *p'* (shown particularly in Fig. 12) are adjustable to vary the throw of the arms *O'* and *P'*. The frame *A*, it will be observed, is slotted at *a*, and the trunnions *a'* of the bearings *o'* and *p'* fit into concentric sleeves, which are provided with the clamp-collars *a*² *a*³, that may be tightened and loosened to permit of the adjustment of the bearings in the frame, while the bearings are adjustable on the rods *O'* and *P'* by means of the set-screws *a*⁴, as indicated in Figs. 10 and 12. It will thus be seen that the delivery-tube and cutting-disk are similarly actuated, so as to cause both the cutter and the completed cigarette, as it passes through the delivery-tube, to vibrate laterally relatively to the normal line of movement of the cigarette, and thus insure a very quick action with the minimum of lateral movement. It will likewise be observed that both the cutter and delivery-tube are caused to move simultaneously and quickly with the continuous cigarette while severing it, and that an even cut is insured.

The cutting devices may be covered, if desired, by a table *R*, mounted on suitable supports, to protect the operator and afford a receptacle for tools. A driving-belt *S* encircles the pulley *S'*, which is connected by a suitable clutch and lever *S*² with a horizontal longitudinal driving-shaft *S*³, mounted in suitable bearings in the main frame.

The carding-cylinder *C* and brush *D* are driven from the driving-shaft by a belt *T*, and the flanged filler-carrying wheels *F* and *G* are driven from the driving-shaft by a worm *u*, meshing with a worm-gear *U* on the shaft *F'*. The wheels *F* and *G* are preferably of large diameter, (the larger one being, say, thirty-six inches in diameter,) so that they may be driven at a comparatively slow speed and yet have a rapid peripheral movement.

The grooved compressing-wheel *H* is driven by friction from the wheels *F* and *G*, the flanges of the latter being in contact with the wheel *H*, as shown in Figs. 4 and 6. The

driving-wheel *J'* is driven by a worm *v* on the driving-shaft, which meshes with a worm-gear *V* on the shaft of the wheel *J'*. A worm-gear *w*, secured to an upright shaft *W*, is actuated by a worm *w'* on the driving-shaft and operates mechanism which supplies paste to the paste-wheel *N*. A plunger movable vertically in the paste-receptacle *N'* carries a rack *n*, actuated by a gear on a shaft carrying a pulley *w*², rotated by a weight *w'*, substantially in the manner shown in my patent above mentioned. A bevel-gear *q'* on the driving-shaft meshes with a corresponding gear *q*² on the vertical shaft *Q'*, which carries a spur-gear *Q*, hereinbefore mentioned, for actuating the delivery-tube and cutter-disk. The cutter-disk is rotated from the driving-shaft by a flexible band *x* encircling a pulley *X* on the driving-shaft and a pulley *X'* on the cutter-shaft.

In operation fibrous tobacco, in a loose shredded condition, is fed by hand upon the apron *B* and carried to the carding-cylinder *C*, which draws out the fibers which are released therefrom by the more rapidly-revolving brush *D* and discharged through the open bottom of the hopper *E* onto the periphery of the main carrying-wheel *F* and between its flange *f* and the corresponding flange *g* of the concentric carrying-wheel or ring *G*. The gradual approximation of the converging flanges *f* and *g* compresses the tobacco laterally, as the wheels rotate, into the annular semicircular groove *f'* and under the grooved compressing-wheel *H*, which compresses it into a cylindrical rod and discharges it over the guide *I* upon the paper-wrapper strip *k*, which moves lengthwise over the tension spring-plate *K'*. The belt *J* carries the wrapper and filler through the folding and wrapping devices, during its passage through which paste is applied to one edge of the paper strip by the paste-wheel *N*, the pasted edge of the paper being folded down upon the other edge and sealed so as to envelop the filler and form a continuous cigarette. The belt then flattens out in passing over the large wheel *J'* and the continuous cigarette passes through the longitudinally-movable delivery-tube, which also vibrates laterally across the normal line of travel of the continuous cigarette. The cutter-disk likewise has a similar longitudinal and also a lateral movement, as before described, to sever the cigarette-rod at suitable intervals into cigarettes of smokable lengths.

I claim as of my own invention—

1. A filler-forming device for cigarette machines, comprising two concentric flanged wheels rotating in the same direction but at a slight angle to each other, so as to compress laterally tobacco deposited between the flanges, in combination with wrapper applying devices and a conductor extending from the periphery of the wheels beneath the compressed tobacco to the wrapper applying devices to arrest the movement of the filler with the wheels and convey it to the wrapper ap-

plying devices, substantially as hereinbefore set forth.

2. A filler-forming device for cigarette machines, comprising two concentric flanged wheels working at a slight angle to each other, and provided with detachable interlocking devices for driving one from the other at the same speed and in the same direction, substantially as hereinbefore set forth.

3. A filler-forming device for cigarette machines, comprising a flanged carrying wheel rotating in a fixed position, and a second flanged ring or wheel concentric with the other, and rotating on a shaft adjustable relatively to that of the fixed wheel, and slightly inclined relatively thereto, substantially as hereinbefore set forth.

4. A filler-forming device for cigarette machines, comprising a flanged carrying wheel rotating in a fixed position, a second flanged ring or wheel concentric with the other, and rotating on a shaft adjustable relatively to that of the fixed wheel, and slightly inclined relatively thereto, and detachable interlocking devices to drive one wheel from the other, substantially as hereinbefore set forth.

5. A filler forming device for cigarette machines comprising a carrying wheel provided with a flange and an annular groove in its periphery, a second flanged wheel or ring concentric with the first and having its axis slightly inclined relatively thereto and a compressing wheel grooved correspondingly with the grooved carrying wheel and working between the flanges of both wheels with its groove registering with the groove of the carrying wheel.

6. A filler-forming device for cigarette machines, comprising a flanged wheel having an annular groove in its periphery adjacent to the flange, a second flanged wheel concentric with the first and rotating on an axis slightly inclined relatively thereto, mechanism for discharging tobacco in regulated quantities between the flanges, a grooved compressing-wheel to compress vertically into cylindrical rod-like form the tobacco carried and laterally compressed by the flanged wheels, a conductor beneath the compressed tobacco and below the compressing-wheel extending from the flanged wheels beneath the compressing wheel to the wrapper guide, a wrapper guide, and a carrying-belt entering said guide below the conductor, substantially as hereinbefore set forth.

7. A filler-forming device for cigarette machines, comprising a flanged, annularly grooved carrying-wheel, a second flanged wheel concentric with the first and rotating on an axis slightly inclined relatively thereto, mechanism for discharging tobacco in regulated quantities between the flanges, a grooved compressing-wheel to compress vertically into cylindrical rod-like form the tobacco carried and laterally compressed by the flanged wheels, a conductor beneath the compressed tobacco and below the compress-

ing wheel extending to the wrapper guide, a wrapper guide, a carrying-belt entering said guide below the conductor, a scraper for the compressing-wheel, and yielding guides to keep the paper wrapper strip in position, substantially as hereinbefore set forth.

8. The combination of two concentric flanged wheels rotating in the same direction, but at a slight angle to each other so as to compress laterally tobacco deposited between the flanges, feed rolls mounted above the flanged wheels and rotating in a direction at right angles to the rotation of the said wheels, wrapper applying devices arranged above the plane of the axes of the flanged wheels and a conductor for conveying the filler from the flanged wheels to the wrapper applying devices.

9. The combination of two concentric flanged wheels, two separate shafts to which the wheels are independently connected and one of which is arranged at an angle to the other, means for driving the wheels in the same direction, means for feeding tobacco thereto and wrapper applying devices to which the filler formed by the wheels is delivered.

10. A tension device for the paper roll of a cigarette machine, comprising a stud-shaft fixed on the main frame, a sleeve thereon, a plate-spring fastened to the sleeve at one end and bearing on the periphery of the paper roll at the other, another sleeve on the stud-shaft, a spring connected with said sleeve, and bearing on the plate-spring, and a locking device connecting the shaft and sleeve to vary the tension of the spring and thereby vary the tension on the paper roll.

11. A wrapper guide and tension device for a cigarette machine comprising a plate which the wrapper strip traverses lengthwise and which is adjustably secured at one end to the main frame and bears on the periphery of the paper roll at the other end, and a spring for moving the plate toward the paper roll.

12. The combination of the paper roll, the guide and tension plate which bears on the periphery of the paper roll, guide pins secured to the plate on opposite sides of the paper roll and an adjustable connection between the plate and the main frame of the machine.

13. An automatic cigarette severing device comprising a delivery tube, a centrally pivoted rocking arm on which it is mounted, a cutter, a centrally pivoted rocking arm on which it is mounted, intermeshing gears to one of which each arm is eccentrically pivoted to impart a longitudinal movement to both the delivery tube and cutter as well as a lateral vibration relatively to the normal line of travel of the continuous cigarette, and means for driving the intermeshing gears, substantially as set forth.

14. An automatic cigarette severing device, comprising a delivery tube, a centrally pivoted rocking arm on which it is mounted, a cutting disk, a centrally pivoted rocking arm

on which it is mounted, intermeshing gears to one of which each arm is eccentrically pivoted to impart a longitudinal movement to both the delivery tube and cutter as well as a lateral vibration relatively to the normal line of travel of the continuous cigarette, a driving shaft, gearing connecting the driving shaft with the intermeshing gears and gearing connecting the driving shaft with the cutter to rotate the latter, substantially as hereinbefore set forth.

15. The combination of a delivery tube, a cutter, an arm on one end of which the cut-

ter is mounted, means connected with the opposite end of the arm to vibrate it, a swivel bearing through which the arm extends, and means for adjusting the bearing to vary the throw of the cutter, substantially as hereinbefore set forth.

In testimony whereof I have hereunto subscribed my name.

WILLIAM C. BRIGGS.

Witnesses:

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T. A. WILSON.