

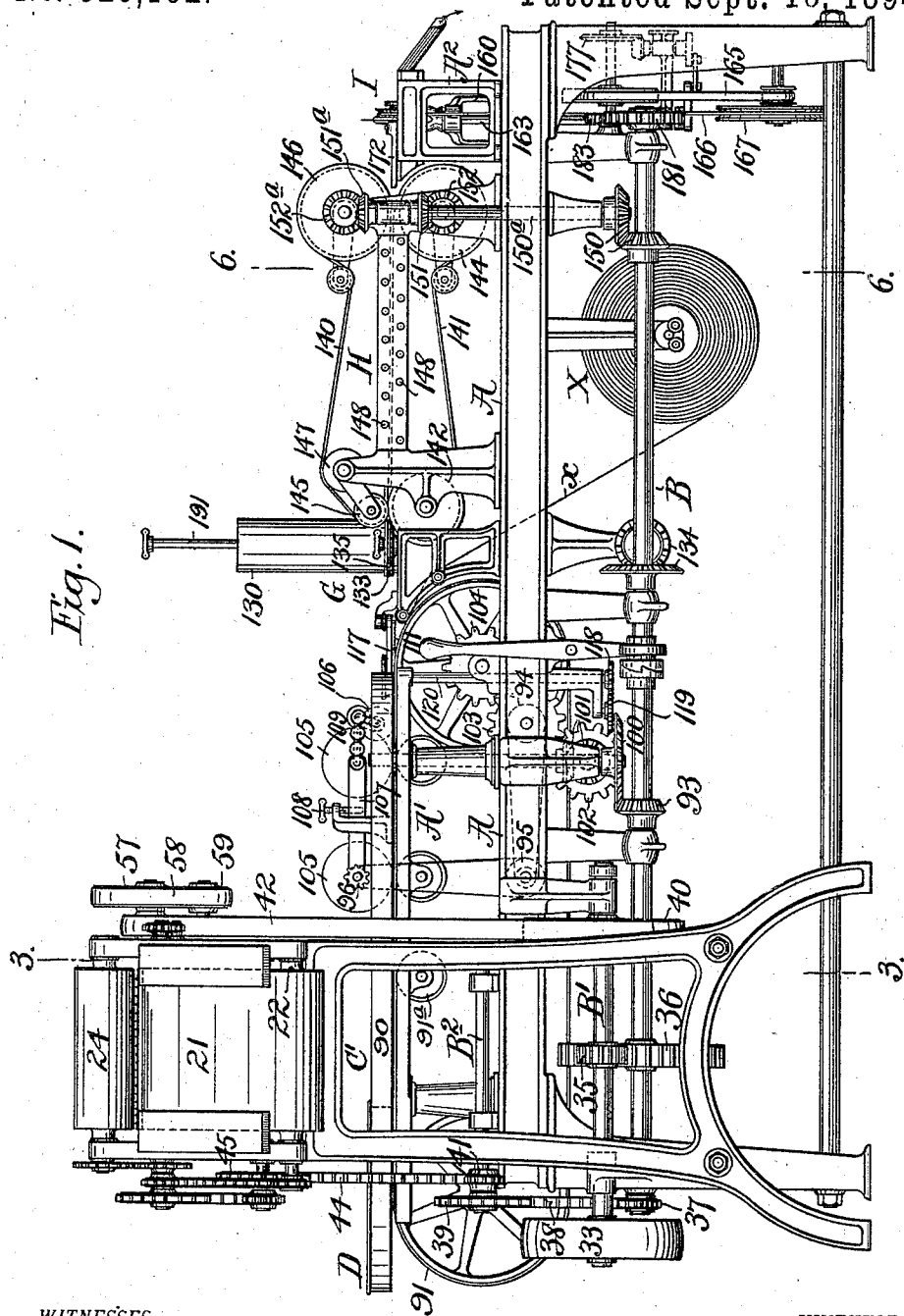
(No Model.)

7 Sheets—Sheet 1.

A. L. MUNSON.
CONTINUOUS CIGARETTE MACHINE.

No. 526,192.

Patented Sept. 18, 1894.



WITNESSES:

U. J. Goetz
H. Graham

INVENTOR

Albert L. Munson

BY

E. H. Graham
ATTORNEY

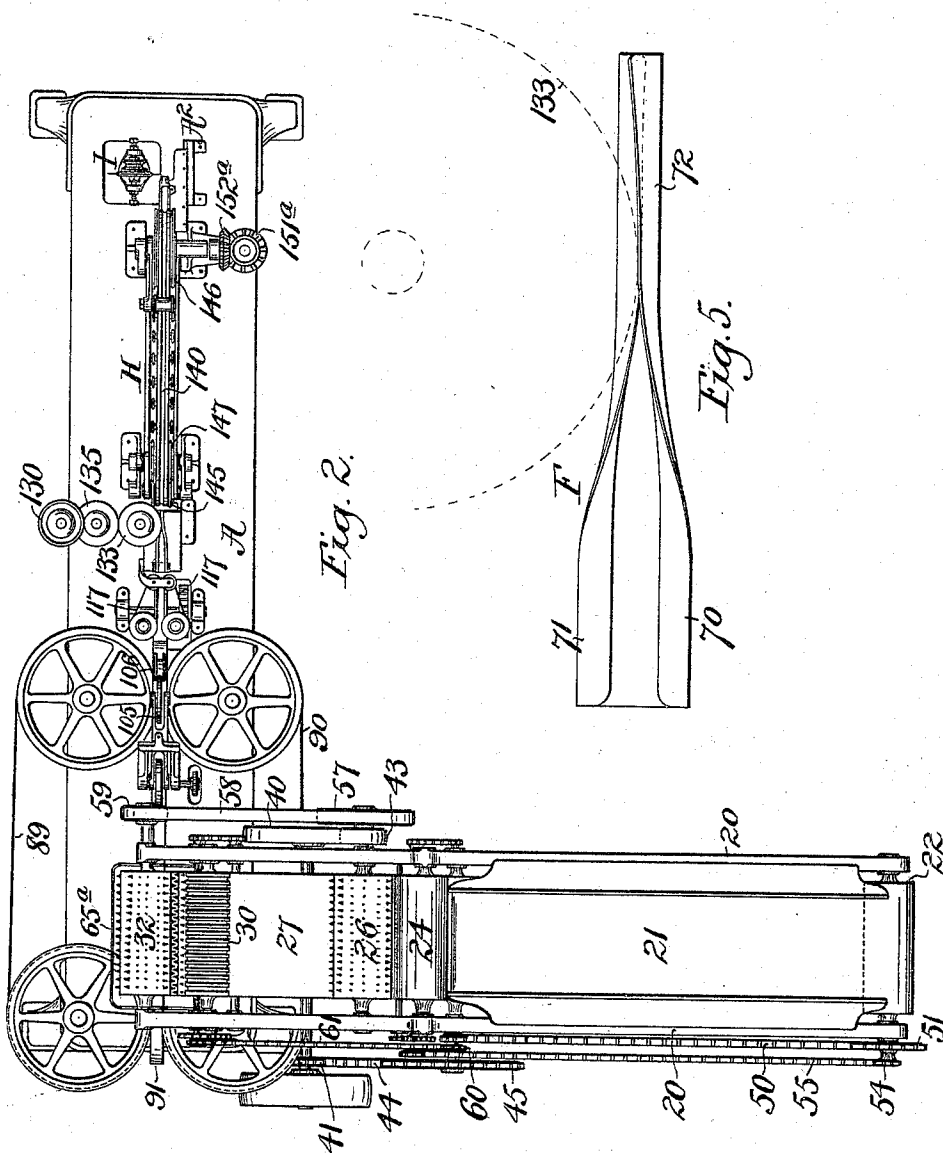
(No Model.)

7 Sheets—Sheet 2.

A. L. MUNSON.
CONTINUOUS CIGARETTE MACHINE.

No. 526,192.

Patented Sept. 18, 1894.



WITNESSES:

V. J. Gorty.
H. Graham

INVENTOR

Albert L. Munson,

BY

Geo. H. Graham
ATTORNEY

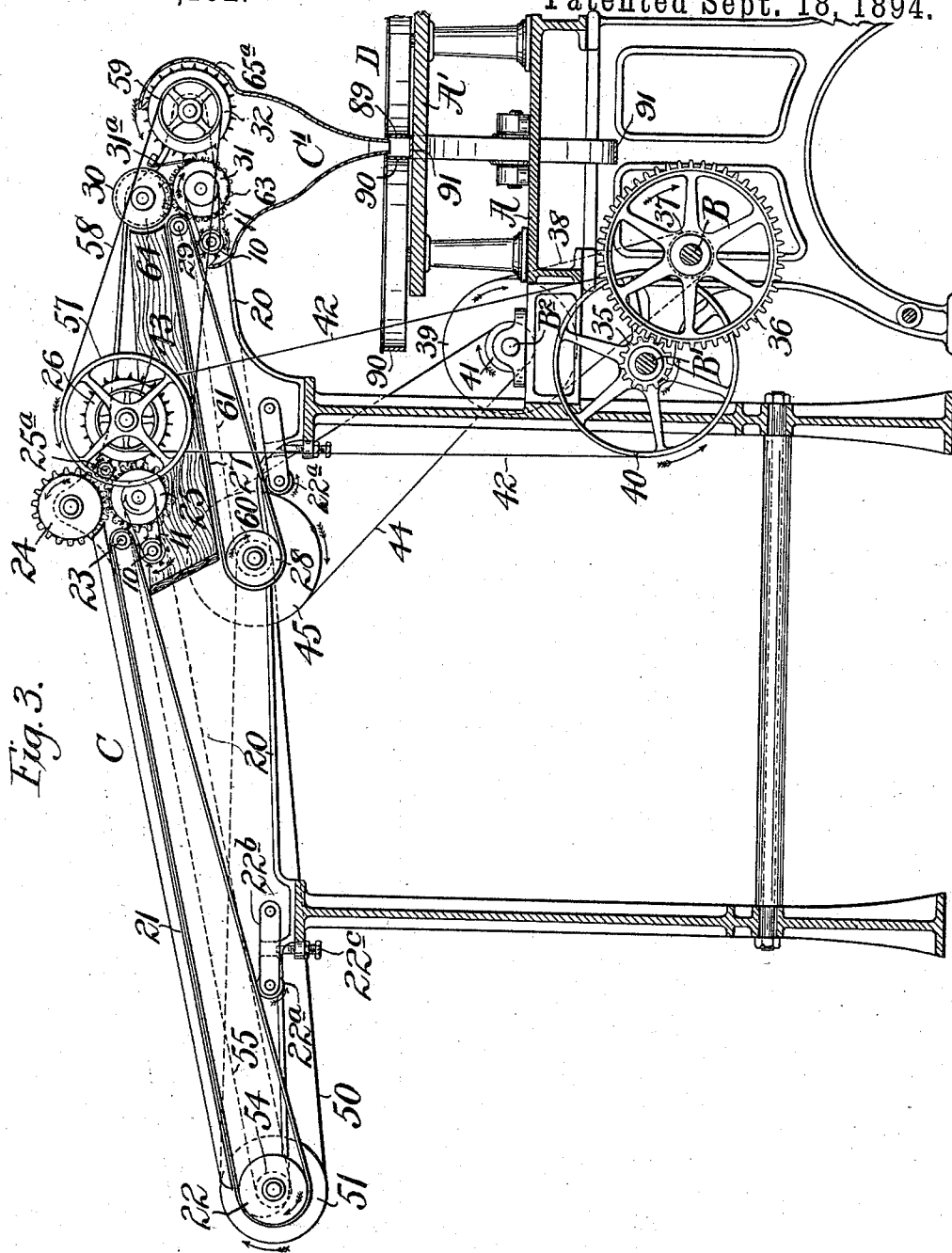
(No Model.)

7 Sheets—Sheet 3.

A. L. MUNSON.
CONTINUOUS CIGARETTE MACHINE.

No. 526,192.

Patented Sept. 18, 1894.



WITNESSES:

V. J. Gooty
H. Grabam

INVENTOR

Albert L. Munson

BY

Geo. H. Grabam
ATTORNEY

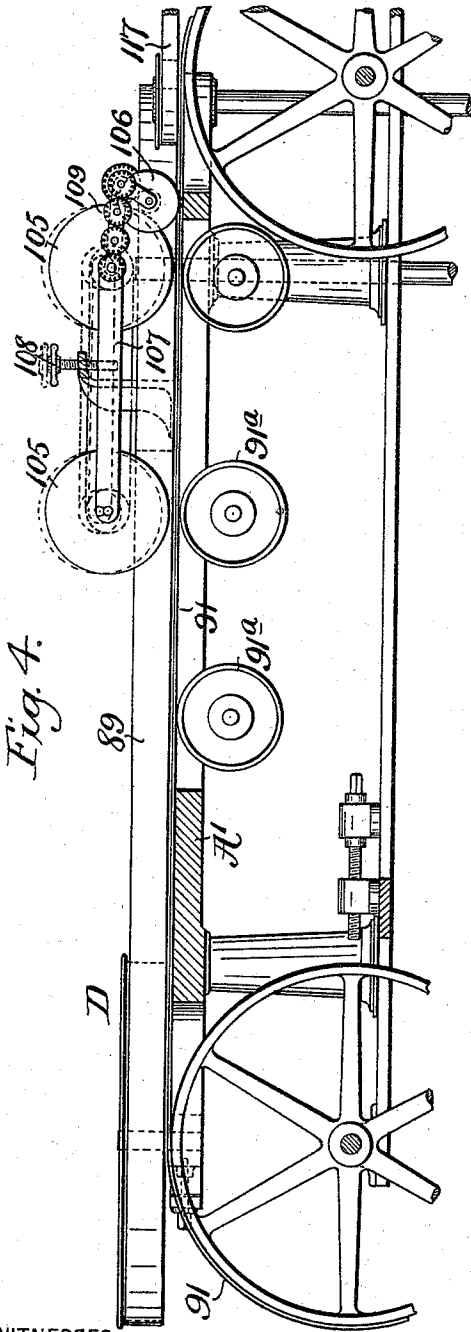
(No Model.)

7 Sheets—Sheet 4.

A. L. MUNSON.
CONTINUOUS CIGARETTE MACHINE.

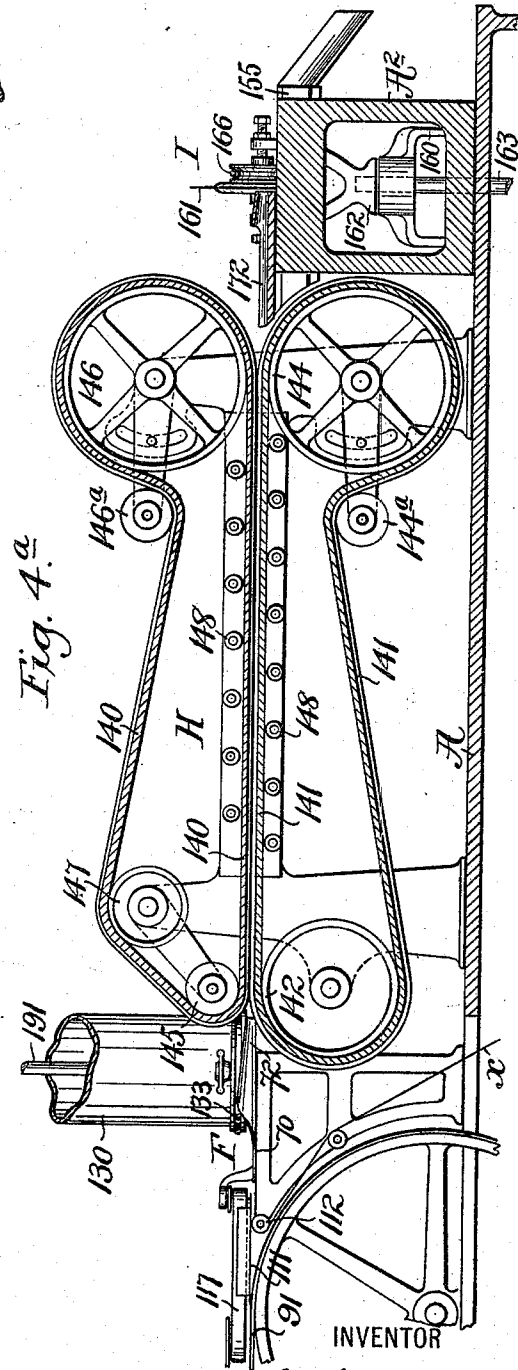
No. 526,192.

Patented Sept. 18, 1894.



WITNESSES:

V. J. Gutz
H. Graham



INVENTOR

Albert L. Munson

BY

Ernest Graham
ATTORNEY

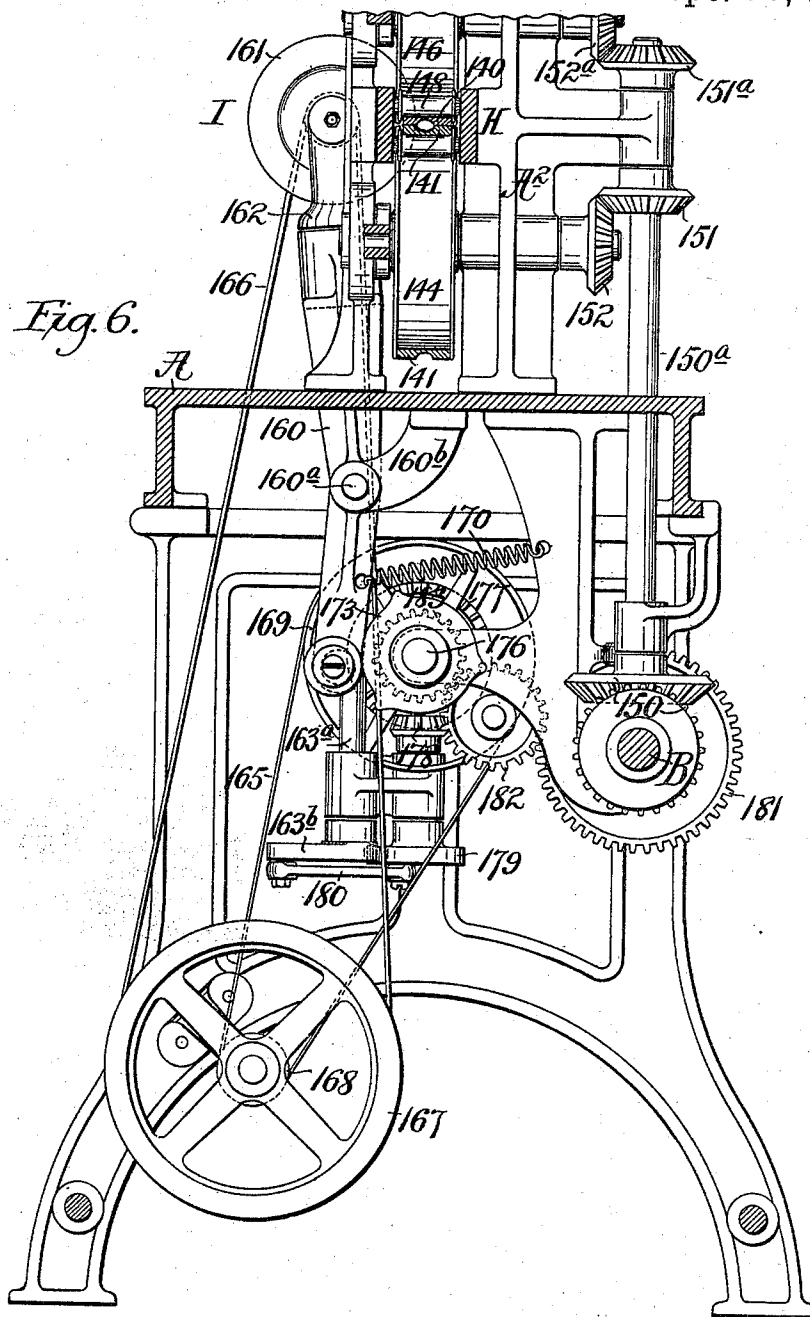
(No Model.)

7 Sheets—Sheet 5.

A. L. MUNSON.
CONTINUOUS CIGARETTE MACHINE.

No. 526,192.

Patented Sept. 18, 1894.



WITNESSES:

V. J. Goetz
H. Graham

INVENTOR

Albert L. Munson.

BY

E. H. Graham
ATTORNEY

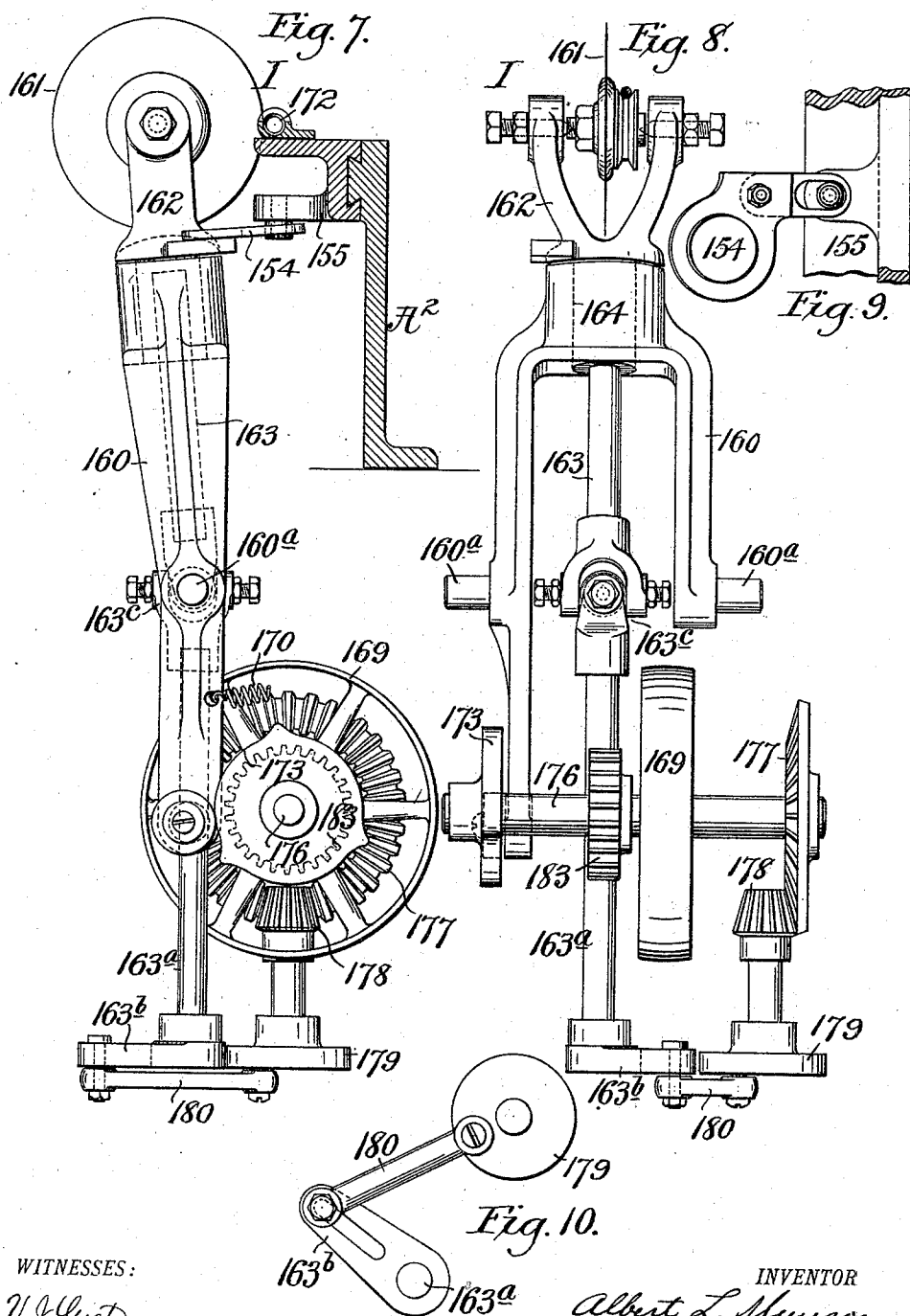
(No Model.)

7 Sheets—Sheet 6.

A. L. MUNSON.
CONTINUOUS CIGARETTE MACHINE.

No. 526,192.

Patented Sept. 18, 1894.



WITNESSES:

U. J. Goetz
H. Graham

INVENTOR

Albert L. Munson,

BY

Edw. M. Graham
ATTORNEY

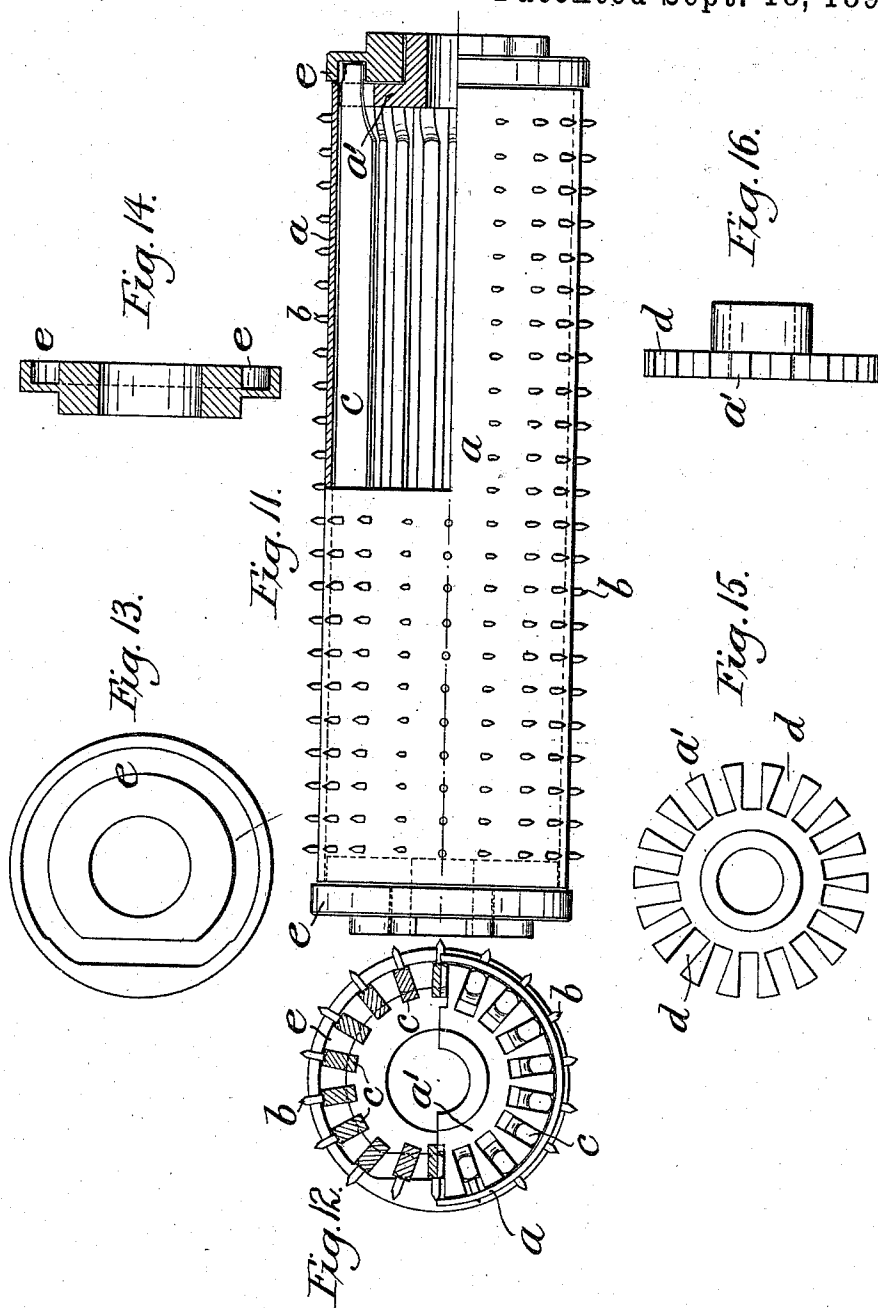
(No Model.)

7 Sheets—Sheet 7.

A. L. MUNSON.
CONTINUOUS CIGARETTE MACHINE.

No. 526,192.

Patented Sept. 18, 1894.



WITNESSES:

V. J. Goetz
H. Graham

INVENTOR

Albert L. Munson

BY

H. Graham

ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT L. MUNSON, OF NEW YORK, N. Y.

CONTINUOUS-CIGARETTE MACHINE.

SPECIFICATION forming part of Letters Patent No. 526,192, dated September 18, 1894.

Application filed January 8, 1894. Serial No. 496,220. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. MUNSON, a citizen of the United States of America, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Continuous-Cigarette Machines, of which the following is a specification.

This invention relates generally to machines for making cigarettes; and particularly to that class of such machines wherein the tobacco in the form of a continuous filler is enveloped by a continuous wrapper strip to one edge of which a line of cement is applied so that when the edges of the strip overlap and meet they will unite completely enveloping the filler to form a continuous cigarette ready to be severed into short lengths or cigarettes.

The object of the present invention is, among other things, to provide an automatically operating machine for the production of cigarettes, and by which cigarettes are speedily and economically made; and to this end the invention consists in the novel structure, arrangement and combination of parts hereinafter fully set forth.

In the accompanying drawings which illustrate a practical embodiment of the present improvements:—Figure 1 is a side elevation of the complete machine. Fig. 2 is a plan view of the same. Fig. 3 is a vertical cross section on the line 3, 3, of Fig. 1, showing particularly the tobacco feeding device and a portion of the filler former, the pulleys and belts of the feeding device on the right of the frame in Fig. 1 being shown in position in this figure. Figs. 4 and 4^a together form a longitudinal central section of the operative parts of the machine above the table A. Fig. 5 is a plan of the wrapper former detached from the machine with the paste wheel in dotted lines. Fig. 6 is an enlarged cross section on the line 6, 6, of Fig. 1 looking toward the right hand end of the machine. Fig. 7 is an elevation of the cigarette severing device looking in the same direction as in Fig. 6, with a bracket in section. Fig. 8 is a side view of said device. Fig. 9 is a detail of the slide looking from the underside. Fig. 10 is a bottom plan of the means for vibrating the cut-

ter-head and cutter. Fig. 11 is an enlarged side elevation of one of the picker rolls, a portion being in section. Fig. 12 is a sectional end view. Figs. 13 and 14 are an elevation and section of a cam; and Figs. 15 and 16 are an end view and side view of one of the heads of the picker roll.

Before entering into a detailed description of the construction and operation of the various instrumentalities which go to form the complete organization illustrated, it may be stated that such organization embraces first, a means by which the tobacco is prepared and fed in condition to be operated upon by the cigarette forming devices, and hereinafter called the tobacco feeding devices, which include a vertical tobacco conduit, channel or passageway; second, means by which the loose tobacco fed to the machine is prepared in the form of an endless filler and fed forward, and hereinafter called the filler-former or filler-forming devices; third, means by which a wrapper strip is fed in position to be fed forward from a roll or other source of supply in position to meet the filler to envelop the latter, and hereinafter termed the wrapper strip paying off or feeding devices; fourth, means by which the wrapper strip is curved and turned over the continuous filler to envelop the same, and hereinafter termed the wrapper former or guide; fifth, means by which a line of paste is applied along the edge of the wrapper strip, and hereinafter called the pasting device; sixth, means by which the continuous cigarette or wrapper strip with inclosed filler is fed or carried positively forward, and hereinafter called the cigarette carrier; and, seventh, means by which the continuous cigarette is severed into cigarette lengths, and hereinafter called the severing device.

As herein combined the above mentioned several devices co-operate to feed the loose tobacco to the machine, prepare such tobacco in the form of a continuous cigarette-filler, feed said filler forward to the wrapper strip, feed the wrapper strip forward to meet the filler, partially envelop the filler with the wrapper strip, apply a line of paste to one edge of the wrapper strip, complete the wrapping of the wrapper strip around the filler,

carry the continuous cigarette thus made forward and sever it into cigarette lengths forming complete cigarettes ready for the market.

The devices for producing the continuous cigarette may be of the character set forth in my Patent No. 507,631, granted October 31, 1893, or may be of other well known construction.

Referring now to the drawings, it is to be understood that these various instrumentalities are all mounted upon or carried by a supporting table A, from which is also supported a main driving shaft B that imparts the necessary movements to the operative parts of the machine.

As a detailed description of the construction, arrangement and operation of the various devices forming the machine illustrated may be best had by describing each of the devices hereinafter mentioned forming the complete organization, such method of description will be adopted, at the same time indicating at the proper time the relation of each of said devices with the others and their manner of co-operation in the construction and function of the entire organization.

The tobacco-feeding devices.—The tobacco feeder C is mounted in a suitable frame work, see Figs. 1, 2 and 3, rising from the machine table at the left hand of the machine, and is arranged to prepare and feed the loose tobacco forward at right angles to the ultimate direction the prepared filler, wrapper-strip and completed cigarette move. These devices consist of two aprons and their respective picker rolls, the aprons being arranged somewhat inclined to carry the tobacco which may be placed thereon and deliver it into the picker rolls. The primary apron 21 is stretched around a pair of rolls 22, 23, journaled in the framework 20, the inner roll 23 being shown of less diameter than its companion roll 22, and there is provided a stretcher roll 22^a that is mounted in a pair of pivoted arms 22^b adjusted and held in their adjusted positions by an adjusting screw shaft 22^c. There is also provided an upper roll 24 immediately beyond the inner end of the apron 21 adapted to coact with the apron to carry the tobacco onto the picker roll 25 of a pair of picker rolls 25, 26. These picker rolls by their peculiar picking operation and by their peculiar construction, to be hereinafter explained, separate or loosen the tobacco fed to them by the primary apron so that in falling therefrom onto the secondary apron 27, it will be loosened with the fibers more or less separated preparatory to be formed into the cigarette filler. The secondary apron 27 is located immediately below the picker rolls 25, 26, and is stretched around rolls 28, 29, that are mounted in the framework 20, and at the upper end of said apron there is provided a grooved roll 30 and immediately below it and beyond the end of the apron there is mounted a pair of picker rolls 31, 32, which take and act upon the tobacco fed to them by the sec-

ondary apron and separate and further loosen the tobacco and permit it to fall or deliver it into a vertical passageway C' that leads at its lower end to the filler former hereinafter described. The grooved roll 30 allows the picker pins of the picker roll to enter beyond its periphery so as to take the tobacco that may cling to its surface and thus enable the tobacco to be laid evenly and solidly onto the picker rolls in the best shape for the picking action of such rolls. Suitable motion, in the present case continuous motion, is imparted to these aprons and rolls from a counter driving shaft B' mounted in bearings at the left hand end of the machine, see Fig. 3, and carrying a driving pulley 33. Said shaft is also provided with a driving pinion 35 that meshes with a gear wheel 36 on the end of the main driving shaft B, through which said shaft is driven. The main shaft B is also provided with a pulley 37 from which, through a belt 38 stretched around said pulley 37 and another pulley 39, motion is imparted to an intermediate shaft B² that is mounted in bearings on the machine table A and to which said latter pulley is secured. This intermediate shaft carries a pulley 41 from which there is stretched a belt 44 passing around a pulley 45 on the shaft of the apron roll 28. The countershaft B' likewise carries a pulley 40 from which is stretched a belt 42 passing around a pulley 43 on the shaft of the picker roll 26. The belt 44 drives the apron 27 and by a belt 50 leading around a pulley 51 on the shaft of the apron roll 22, also drives the apron 21. The shaft of the apron roll 22 also carries a pulley 54 from which is stretched a belt 55 passing around a pulley on the shaft of the picker roll 25 thereby driving that roll and by a pair of gears also drives the upper roller 24 and an intermediate laying roller 25^a. The shaft of the apron roll 28 also carries a pulley 60 from which is stretched a belt 61 passing around a pulley on the shaft of the picker roll 31 thereby driving that roll, and by a pair of gears 63 driving the grooved roll 30. The shaft of the picker roll 26 carries a pulley 57 from which is stretched a belt 58 passing around a pulley on the shaft of the picker roll 59 to drive that roll. These various driving pulleys and belts may be sprocket wheels and chains, as is obvious. The motion of the counter driving shaft B' is transmitted to the intermediate shaft B² and from thence by the several belts and pulleys to each of the aprons 21, 27, and to the several rolls and picker rolls, so that the tobacco that is spread upon the primary apron by the attendant is fed forward beneath the roll 24 onto the picker roll 25 and thence into the bite of said roll and its companion picker roll 26 which pick, loosen and otherwise operate upon the tobacco so that it will fall in a separated or loosened state upon the secondary apron 27 and this tobacco will be again fed forward by said secondary apron beneath the roll 30 into the picker roll 31, and thence into the

bite of said roll and its companion picker roll 32 and by them again picked and loosened and delivered therefrom into the passageway or channel C'. The roll 32 is provided with a shield 65^a, thereby confining the tobacco to the machine. The picker rolls 25, 26, may be provided with an intermediate deflecting roll 25^a which tends to direct the tobacco downward into their bite, and the other picker rolls 31, 32, may be provided with an intermediate deflecting plate or fingers 31^a for a similar purpose. The general construction of the picker rolls as herein shown is substantially the same, although only one of each pair may be constructed as shown in Figs. 11 to 16, and consist of a hollow cylinder or shell *a* provided with openings in its periphery to permit the protrusion and withdrawal of rows of picker pins *b*. The picker pins *b* are secured to and project from a multiplicity of cross rods *c*, the opposite ends of which project through slots *d* in the heads *a'* of the hollow cylinder or shells *a*, for contact with a pair of cams *e*, carried by the frame work at each end of the roll. The shape of the cams *e* is such that as the picker roll rotates in the direction of the arrow, Fig. 3, the protruding ends of the cross rods *c* successively leave the concentric portion of the cams *e* which normally holds the pins protruding to bear against the straight portion, see Fig. 13, which moves said cross rods inwardly toward the axis of the roll so as to withdraw the pins to a point within its periphery and thus effectually strip or clean such pins of any tobacco that may cling thereto, and permit it to fall either onto the secondary apron 27 or into the vertical passageway C'. As the picker roll rotates and the ends of the cross rods *c* successively leave the straight portion of the cams, they enter concentric portions of the cams and are again moved outwardly so as to project their pins from the periphery of the roll ready for the succeeding picking operation. While, as before stated, this construction of the picker roll applies to each one of the two sets of picker rolls 25, 26, and 31, 32, it is obvious that it might apply to either of said rolls or to a single pair. The vertical passageway or channel C', into the upper end of which the loose tobacco from the secondary apron is delivered, is supported in any suitable manner from the framework 20, in position to direct the falling tobacco from the picker rolls 31, 32, into the conduit forming the filler former now to be described.

The filler former.—The filler forming devices D are located immediately below the exit of the vertical passageway or channel C' so as to receive the tobacco delivered therefrom. These devices consist of three endless belts 89, 90, and 91, preferably of metal stretched around, guided and supported by suitable rolls so as to form a horizontal trough or channel, the sides of which are formed by the active portions of the belts 89, 90, and the

bottom thereof by the belt 91. The belt forming the bottom of the channel is supported by and moved over a supplementary table A' and over a number of anti-friction rolls 91^a. See Fig. 4. The loose tobacco, as before explained, continuously delivered into the vertical passageway C' is received by the horizontal conduit forming the filler former so that it is carried onward toward the wrapping devices in the onward movement of the filler forming belts. This movement of the filler forming belts which is a continuous one, is derived from the main driving shaft B through a pair of bevel wheels 93, 100, one of which is secured to said driving shaft and the other to one end of a short vertical shaft that carries at its upper end one of the pulleys around which the belt 90 is stretched. The same short vertical shaft drives a horizontal cross shaft through a pair of bevel wheels 101 which convey motion to a similar vertical shaft carrying at its upper end one of the pulleys around which the belt 89 is stretched, and thus the two belts are moved in unison. The other belt 91 is driven from said horizontal cross shaft through gears 102, 103, and 104, the latter secured to the shaft carrying the pulley around which said belt 91 passes, see Fig. 1, so that said belt moves in unison with the other two belts 89, 90, and at the same surface speed carrying the tobacco delivered from the vertical passageway C' forward toward the wrapper forming devices. The tobacco carried along by these belts is pressed or otherwise shaped into rod form by the gradual approach of the side belts toward one another aided, it may be, by one or more presser rolls 105, the peripheries of which extend into the conduit between the belts 89, 90, to bear upon the tobacco being carried forward by said belts and belt 91. The roll or rolls 105 is or are carried by a vertically adjustable frame 107, that is engaged by an adjusting screw 108 by which their pressure upon the tobacco may be regulated. When the machine is in actual operation with a filler passing through the former, the wheels 105 will be at a proper height above the bottom of the former, as for instance as shown in dotted lines in Fig. 4. As herein shown, and in the preferred construction, these presser rolls are positively driven from any proper part of the machine, as, for instance, from the cross shaft carrying the gear wheel 103. This shaft carries a sprocket or pulley 94 driving a pulley 95, which in turn drives another belt that passes around a sprocket or pulley 96 on the shaft carrying one of the pressing rolls 105, and from this shaft the other pressing roll is driven, as by a belt. One of the presser rolls 105 is provided with a pair of side strippers 106 in the form of thin disks mounted one on each side of the roll in close contact with its sides arranged to strip any tobacco that may tend to cling to said roll. These strippers are driven at a speed much faster than the rotation of the presser roll by a train of

gearing 109 taking its motion from a gear on the shaft of said presser roll.

The wrapper strip forming devices.—The wrapper former F is mounted in line with the direction of movement imparted to the tobacco filler by the filler forming belts 89, 90 and 91, previously described so that the filler in passing from said belts will be received by the former F to be incased in the wrapper strip to form the continuous cigarette. The former F, see Fig. 5, in the preferred construction as herein shown, consists of a metal guide, the edges 70, 71, of which from the entrance end of the guide are doubled, and gradually curve and bend inwardly toward each other until they merge into a substantially tubular portion 72, the edge 70 overlying the opposite edge 71, the doubled edges terminating short of the tubular portion. This former is of a shape adapted to gradually curve the wrapper strip from a substantial flat condition in which it enters the former, (the longitudinal edges of which are received within the doubled edges thereof) to a circular or tubular condition in cross section with one edge of the strip temporarily standing vertically in position to lap over onto the other edge. From this point this edge 70 of the former curves downwardly to direct its edge of the wrapper strip over the underlying edge of said strip and finally merges into the tubular portion 72 to carry the one edge of the wrapper strip into firm contact with the underlying portion of the wrapper, thus having entirely incased the tobacco filler. The space between the termination of the filler-former formed by the belts 89, 90 and 91, and the entrance end of the wrapper former F, see Fig. 8, is bridged by a plate 111 supported from some part of the machine, one edge of which plate overlies the belt 91 and its forward edge overlying the entrance of the wrapper strip α , but not touching the end of the former F, so that the tobacco filler is properly supported in its passage from the end of the filler former onto the wrapper strip passing onto the former F. At the entrance end of the former F immediately below the forward end of the bridge plate 111 there is provided a roll 112 over which the wrapper strip is led and from which it passes into the former F beneath the forward end of the bridge plate 111. In this manner the wrapper strip is presented and passes onto the former F separated by the end of the bridge plate 111 from the tobacco filler that is being conducted along said plate onto the wrapper strip. In order to aid the movement of the tobacco filler from the filler-former into the wrapper former there is provided a pair of intermediate side belts 117, which extend on opposite sides of the travel of the tobacco-filler, and aid in properly forwarding it into the former F. These intermediate carrying belts are properly driven continuously from the main driving shaft B through suitable gearing not necessary to describe in detail.

It will be understood that the cigarette thus formed may be either cylindrical in cross section or of any suitable shape.

The paste applying devices.—These devices so far as the other features of invention of the present construction are concerned, may be of any preferred form, but as herein shown, the paster G consists of a vertical fountain 130 supported at the upper end of a bracket rising from the table A. Near the lower end of the paste fountain there is an opening in its side in which lies a portion of an intermediate paste roll 135 that has a grooved periphery running continuously in contact with the periphery of the paster roll 133, the periphery of which latter roll 133 runs in contact with the longitudinal edge of the wrapper strip presented by the upturned edge 70 of the wrapper former F. The entrance of the roll 135 substantially fills the opening in the side of the paste fountain so that there shall be no escape of the paste therefrom, but there may be provided suitable wipers bearing against the periphery of the roll to regulate the amount of paste that is permitted to adhere to the periphery of said roll to be carried and fed to the periphery of the paster roll 133 to be by it applied to the edge of the wrapper strip. As the roll 133 is grooved the wiper may be arranged to leave the paste in its groove, so that the depth of said groove will determine the quantity of paste supplied to the paster roll 133, the peripheral edge of said roll 133 being small enough to take into the groove. The paster roll 133 is continuously rotated in contact with the edge of the wrapper strip and with the grooved periphery of the intermediate roll 132 by a gear 134 secured to the lower end of its shaft which is driven by a pair of intermediates and the wheel before referred to. To effect the proper supply of paste to the roll 132, the fountain is provided with a follower 190, above the paste therein, to continually force the paste into contact with said roll. This follower may be moved downward either continuously from some moving part of the machine, or by hand through the rod 191. The wrapper strip as it passes along through the former F with the tobacco-filler lying thereon and being fed at the same surface speed as the wrapper strip is carried, will be first partially wrapped around the filler, whereupon one longitudinal edge of said strip will be supplied with a line of paste from the paster roll 133 and said pasted edge of the strip in passing into the tubular portion 72 of the former will be folded down or lapped over the underlying edge of the strip so as to be united thereto and thus completely inclose the filler rod which issues from the end of said tubular portion of the former F fully wrapped in the condition of a continuous cigarette.

The cigarette carrying devices.—The cigarette carrier H is mounted immediately beyond the end of the former F and in position to receive the completely formed and con-

tinuous cigarette and to grasp and carry the same forward in a straight line with the filler-former and wrapper-former previously described. This cigarette carrier H consists essentially of a pair of endless elastic carrying belts 140, 141, the lower one of which is stretched from a roller 142, thence in contact for a considerable distance with the companion belt 140 and returns around a roller 144 and tension roller 144^a back to the roller 142. The upper belt is stretched from a roller 145, thence along in contact for a considerable distance with the companion belt 141 and returns around a roller 146 under a tension roller 146^a and over a roller 147 to the roller 145. Each of these belts is so formed as to provide a longitudinal semi-circular recess throughout the length of the belt, the recess of one belt coacting with that of the other belt to form a continuous and unbroken cigarette grasping and carrying tube. Each semi-circular recess is bounded longitudinally on its opposite sides by flat surfaces which coact with similarly flat surfaces on the companion belt throughout the active portions thereof to form abutting and meeting surfaces which support the semi-circular recesses and prevent too great a pressure on the cigarette that is being grasped between and carried by the belts. The several supporting rollers of these two belts 140 and 141 are flanged to keep them in alignment. Immediately between the entrance end of the carrier H and its exit end each of the belts along their active portions is supported and held with their longitudinal flat surfaces in contact one with the other with the walls of the recesses grasping the continuous cigarette, by an interposed series of rolls 148, which are so positioned and arranged with respect to said active portions of the belts as to cause such belts to grasp the cigarette with sufficient firmness as to carry it onward without destroying its shape and at the same time draw forward the wrapper strip from the web or other source of supply. The two endless elastic carrying belts provide an exceedingly effective means for carrying the finished and continuous cigarette forward and obviously may grasp such cigarette evenly and uniformly throughout a long length thereof so that the strain of its carrying movement is distributed over a long length of the cigarette and thus obviate any danger of disrupting the same. The cigarette being confined between these two belts for some time the line of paste uniting the two longitudinal edges of the wrapper strip has a chance to become more or less dry so that when the cigarette ultimately issues from the exit end of the carrier H it will not only be perfectly formed but will be smooth and free from wrinkles. By making each of these carrying belts of some elastic material they may not only be readily stretched around rollers so as to form a continuous cigarette-carrier, but the cigarette receiving and grasping recesses therein are unbroken and free from all joints which

have heretofore been present in a continuous carrier of non-elastic material. By reason of the absence of all joints in the carrier belts and the continuous character of the recesses therein no objectionable creases are imparted to the completed cigarette and no liability of the wrapper being inadvertently caught or pinched between abutting sections as in sectional carriers. The carrying belts may be formed in a suitable mold which will provide the continuous semi-circular recess bounded on opposite sides by the continuous flat surfaces. The carrying belts 140, 141, are driven continuously in unison, at proper speed, and in unison with the speed of the belts of the filler former from the main driving shaft B through a pair of bevel gears 150, one secured to said main shaft and the other to the lower end of a short vertical shaft 150^a, the upper end of which shaft carries bevel wheels 151, 151^a in mesh with similar wheels 152, 152^a, secured to the shafts of the rolls 144, 146, of the lower and upper carrying belts respectively.

The severing device.—As the continuous cigarette issues from between the carrier belts 140 and 141, of the cigarette carrier it is received and temporarily supported by a short semi-tubular guide 172, see Figs. 1 and 2, near the extremity of which is mounted the severing device I. This severing device is in position and operation to sever the continuous cigarette into cigarette lengths as the continuous cigarette moves onward from between the carrying belts. So far as other features of the present invention are concerned, the severing device may be of any of the well known forms, but the novel construction herein shown provides an efficient means by which the continuous cigarette is severed without disfiguring or buckling the cigarette lengths. As herein shown in Figs. 6 to 10, the severing device consists of a revolving cutter 161 mounted in a cutter head 162 that is arranged to laterally vibrate and to oscillate in a horizontal plane or, in other words, to vibrate across the longitudinal axis of the cigarette and also in a plane with the axis of the cigarette. The cutter head 162 has a bearing 164 that is journaled to swing horizontally in the upper end of a rocking frame 160 that is formed with pivots 160^a journaled in a bracket 160^b on the under side of the table A. See Fig. 6. One leg of the frame 160 is provided with a cam roll that is held against the periphery of a revolving cam 173 by a suitable spring 170, see Fig. 7, by which cam the frame 160 is rocked at stated intervals to carry the cutter 161 suddenly across the cigarette to sever it into a suitable length. The cam 173 is mounted on the end of a short longitudinal shaft 176 that is driven at proper speed from the main shaft B by a gear 181, intermediate 182, and gear 183, that is fast to said shaft 176. The shaft 176 also carries a pulley 169 which, through a downwardly extended belt 165, drives the pulleys 168, 167,

on a lower countershaft, the latter pulley 167 having an upwardly extending belt 166 that passes around a pulley on the cutter shaft to drive the cutter 161. The bearing 164 of the cutter head is fast to the upper end of the vertical shaft 163, having a universal joint 163^a that connects its lower end with a shaft 163^b. The shaft 163^a is provided with an arm 163^b connected by a link 180 with crank disk 179 and by such connection during the rotation of the disk the shaft 163^a and its connections with the cutter head and cutter cause the cutter to swing horizontally in the direction of movement of the cigarette and back again in addition to the lateral crosswise movement of the cutter. Motion is imparted to the disk 177 through a bevel pinion 178 and bevel wheel 177, the latter being fast to the shaft 176. The combined lateral and horizontal movements of the cutter head result in causing the cutter to sever the continuous cigarette lengths while the cigarette is in motion and without breaking the paper or buckling the severed ends.

The continuous cigarette issuing from the carrier belts 140, 141, is presented to the action of the severing device before described by passing through the supporting guide 172. Best seen in Figs. 4^a and 7. This guide is attached to and carried by a longitudinally moving slide 155 mounted in ways on the upper part of the frame A². It receives a reciprocatory motion by means of the link 154 which projects from the cutter head 162 above the top of the bearing 164, a pin in the under side of the slide 155, Figs. 7 and 9, playing in a slot in the link, which allows lateral movement of the frame 160 to and from the slide 155 in the act of carrying the cutter across the continuous cigarette. As the cutter head 162 vibrates by the action of the crank disk 179 the link 154 moves in unison therewith and causes the slide 155 with the guide 172 to reciprocate to and fro, which action keeps the face of the guide 172 up to active duty with the cutter during the latter's passage across the cigarette to insure a perfect cut. That portion of the link 154 having the slot before mentioned is adjustably connected to its other portion by the set nut shown, so that the amount of play may be limited and determined as circumstances may require. As the cutter 161 vibrates away from the face of the supporting guide 172 after severing the cigarette, the parts are so proportioned that its movement is much faster than that of the travel of the continuous cigarette, causing the severed cigarette length to be thrown gently clear from both the cutter and the guide. An important element in the use of the improved severing device and the means of driving it lies in the easy manner in which any desired length of cigarette may be severed. The gear 181, Fig. 6, may be a change gear to be substituted for one of more or less teeth so that the time of vibration of the cutter head may be varied to allow a determined length of the continuous cigarette to be fed forward between each severing

movement of the cutter. Thus by such adjustment a variation of one-sixteenth of an inch may be made in cigarette lengths which may thus vary from, say, two and one-half inches to three and one-half inches, the great desirability of which will be readily appreciated by those skilled in this art.

The wrapper strip feeding devices.—It is obvious that the wrapper strip α may be supplied to the former F in any suitable manner and hence no detailed description thereof is necessary. As shown in Fig. 1 it is supplied from a roll X and led upward to the roll 112. See Fig. 4^a.

The operation of the improved machine in detail has been stated in describing the several parts, and hence no further description of the same is deemed necessary. It will be understood, however, that the operation of the machine is continuous, that is to say, the tobacco prepared by the feeding devices is fed continuously into the vertical passageway C', and thence delivered into the conduit formed by the continuously moving filler forming belts to be formed into rod form, adapted to form the filler of the cigarette. From such belts the tobacco filler is continuously moved onto the wrapper strip and incased thereby in passing through the former F; is continuously carried onward by the carrier H in the form of a continuous cigarette, and is finally severed into proper cigarette lengths by the severing device I, ready to be assembled in packages for the market.

What is claimed is—

1. The combination with the cigarette forming devices and means for holding the cigarette, of a cutter-supporting means mounted on two pivots at angles one to the other and carrying a cutter for severing the cigarette into lengths, and means for rocking the supporting means on one of said pivots toward the cigarette and on the other of said pivots longitudinally with the cigarette, as set forth.

2. The combination with the cigarette forming devices, of a cutter supporting means mounted on horizontal and vertical pivots, and carrying a cutter for severing the cigarette into lengths, and means for oscillating and laterally moving said supporting means on said pivots.

3. The combination with the cigarette forming devices, of a laterally vibrated frame with means for vibrating it, a cutter head vertically pivoted in said frame, a cutter carried by the head, and means for oscillating the cutter head.

4. The combination with the cigarette forming devices, of a laterally vibrated frame and means for vibrating it, a cutter head vertically pivoted in said frame and carrying a cutter, and a crank and connections for oscillating the cutter head.

5. The combination with the cigarette forming devices, of a laterally vibrated frame, with means for vibrating it, a cutter head loosely mounted in said frame, and carrying

a cutter, a shaft having a universal joint connection connected to said head, and a crank for oscillating the shaft.

5 6. The combination with the cigarette forming devices, of a frame having horizontal pivots for lateral movement, a cutter-head vertically pivoted in said frame and carrying a cutter, a cam for laterally moving the frame and cutter in one direction, a spring for imparting a lateral movement thereto in the opposite direction, and means for oscillating the cutter-head upon its vertical pivot, substantially as set forth.

15 7. The combination with the cigarette forming devices, of a guide for sustaining the cigarette while being severed, a frame mounted on horizontal pivots, a cutter-head pivotally mounted in said frame and carrying a cutter for the cigarette, a spring connected with said frame, a cam for laterally moving the frame and cutter with respect to the guide against the force of said spring, a link connecting the guide with the cutter-head, and means for oscillating the cutter-head, substantially as set forth.

8. The combination of the tobacco feeding devices, filler former devices receiving the tobacco therefrom, means for applying a wrapper strip to and folding and securing it around said filler, a cigarette carrier for moving forward the continuous cigarette thus formed, mechanism for operating the above described appliances, a holder for the cigarette, a frame mounted on horizontal pivots, a cutter head pivotally mounted in said frame and carrying a cutter for the cigarette, means for oscillating said frame with respect to the guide, a link connecting the guide with the cutter-head, means for oscillating said cutter-head, and connections between said oscillating means and the said mechanism which operates the continuous cigarette-making appliances, substantially as set forth.

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

ALBERT L. MUNSON.

Witnesses:

GEO. H. GRAHAM,
E. L. TODD.