(No Model.)

8 Sheets—Sheet 1.

J. FLOYD & E. J. McCROSSIN.

CIGARETTE MACHINE.

No. 342,344. Patented May 25, 1886.

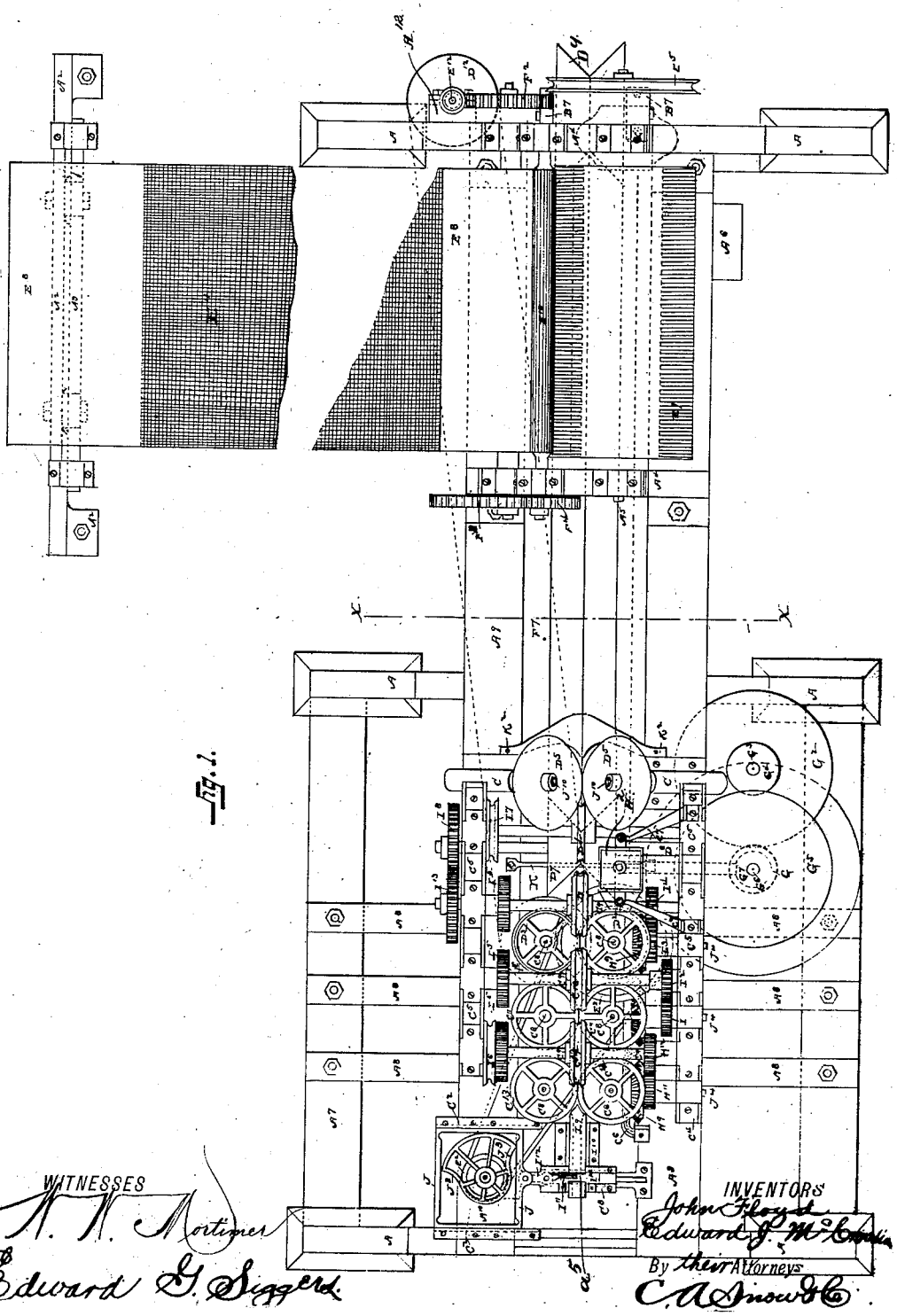

Fig. 1.

WITNESSES

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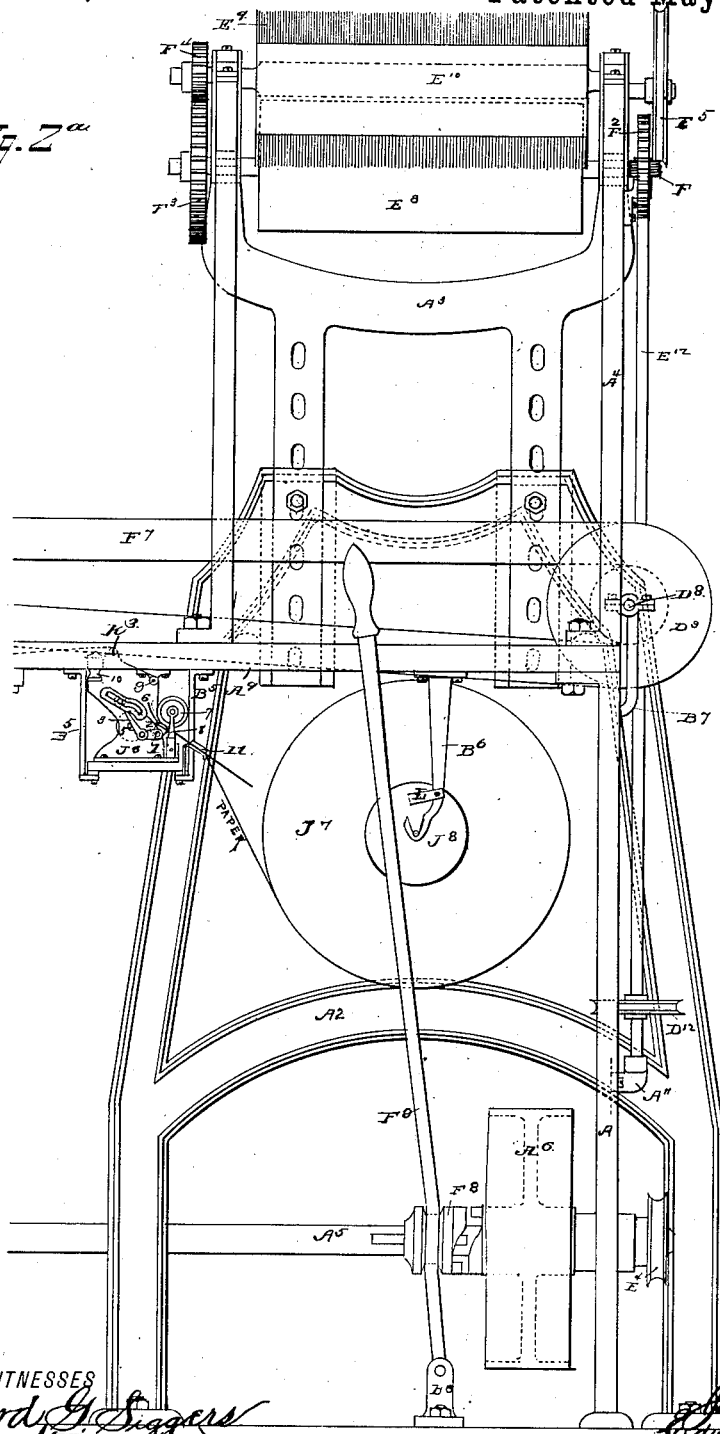
(No Model.) 8 Sheets—Sheet 2.

J. FLOYD & E. J. McCROSSIN.

CIGARETTE MACHINE.

No. 342,344. Patented May 25, 1886.

Fig. 2ª



WITNESSES

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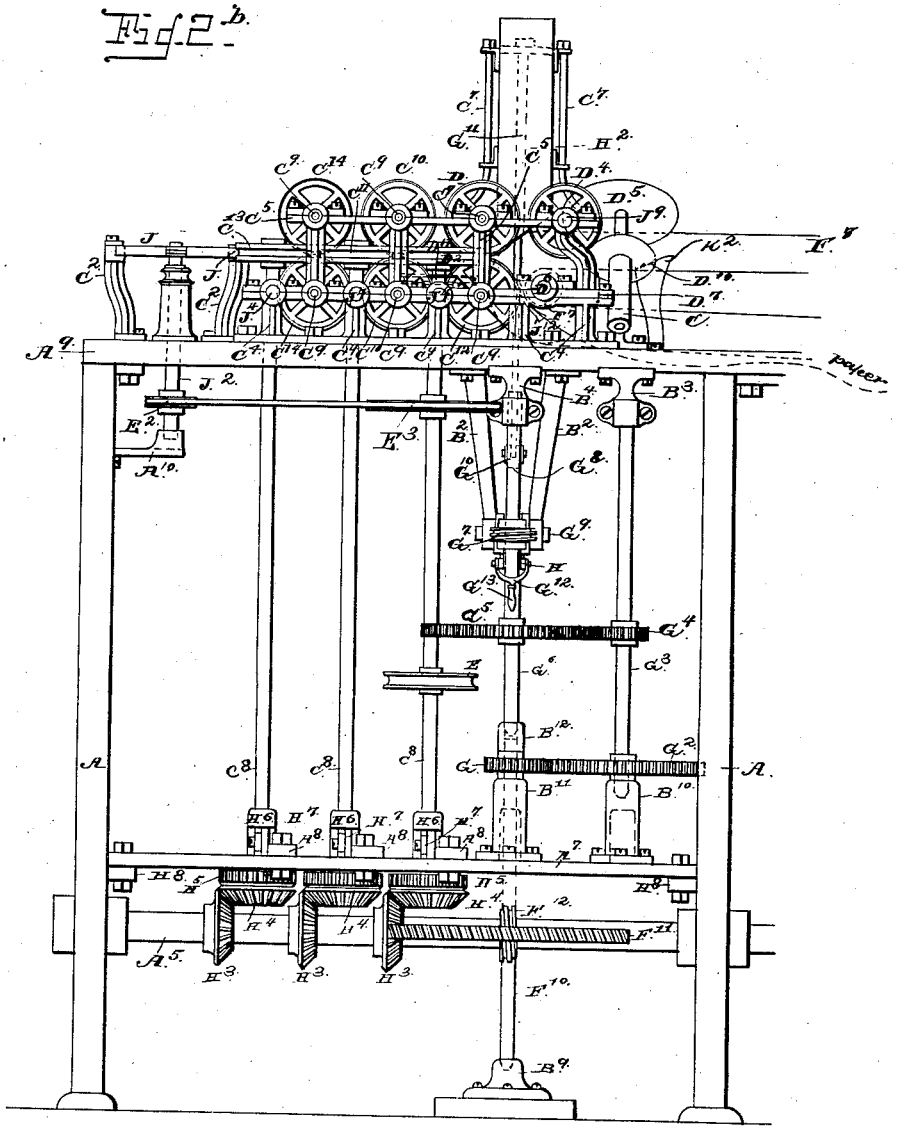
(No Model.) 8 Sheets—Sheet 3.

J. FLOYD & E. J. McCROSSIN.

CIGARETTE MACHINE.

No. 342,344. Patented May 25, 1886.

Fig. 2.



WITNESSES

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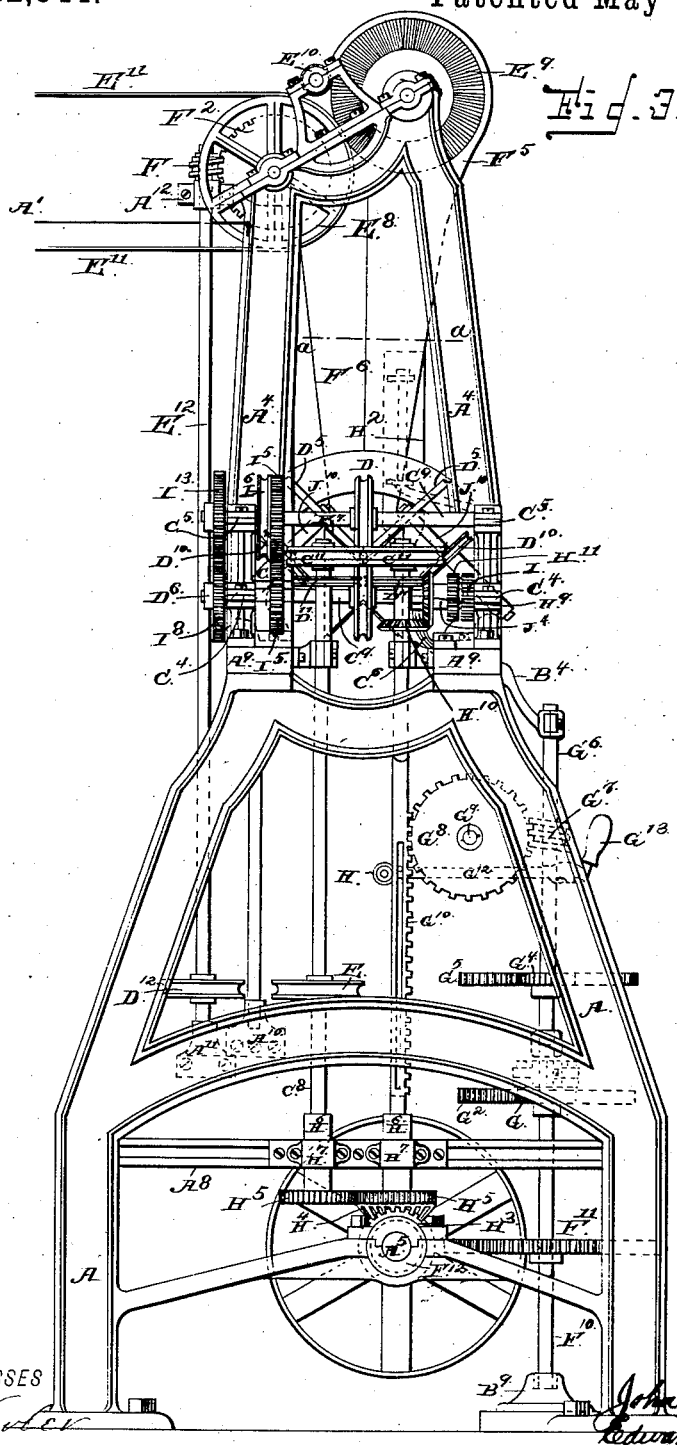
CIGARETTE MACHINE.

No. 342,344. Patented May 25, 1886.

Fig. 3.



WITNESSES

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(No Model.) 8 Sheets—Sheet 5.

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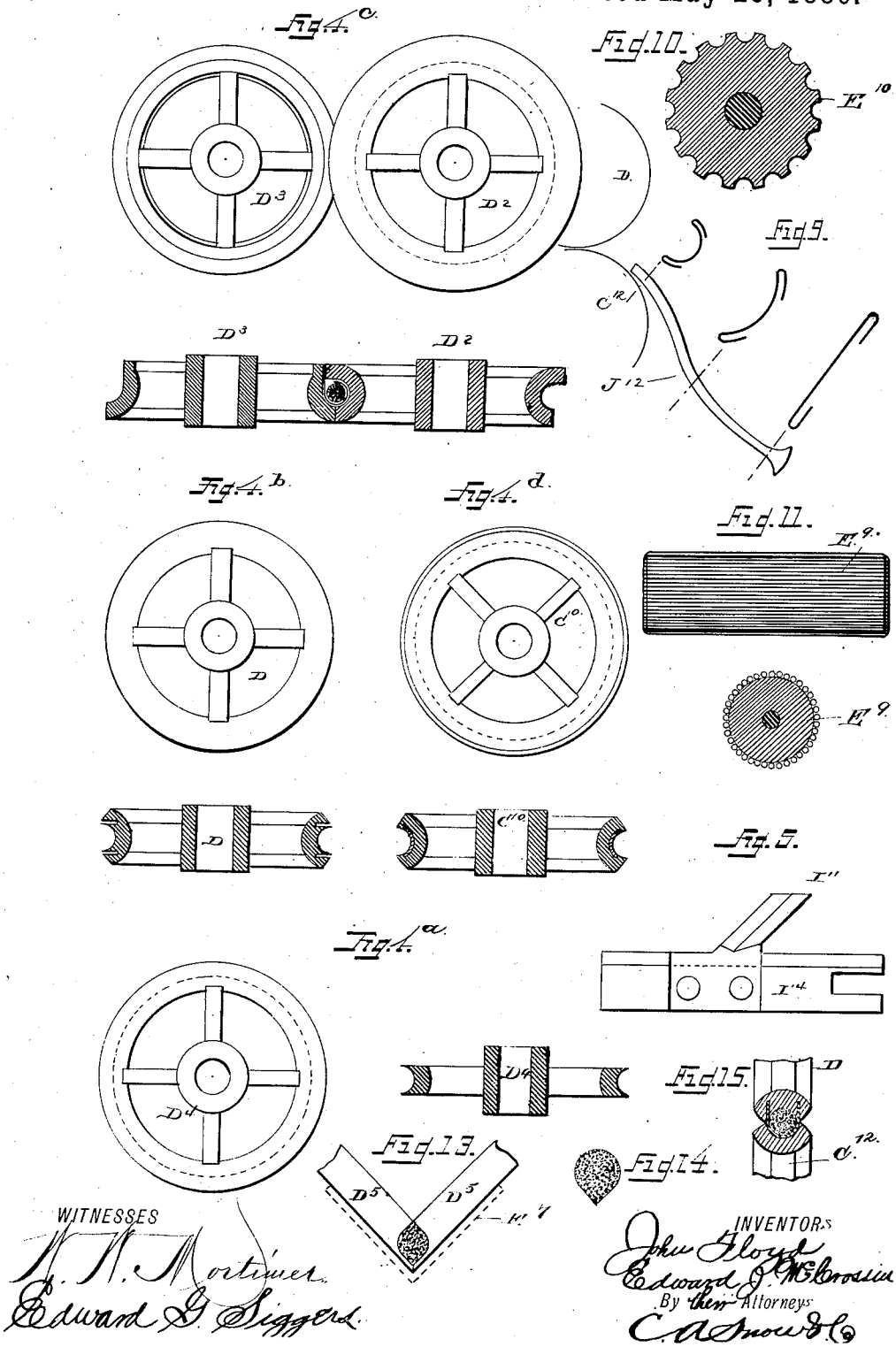
CIGARETTE MACHINE.

No. 342,344. Patented May 25, 1886.



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(No Model.) 8 Sheets—Sheet 6.

J. FLOYD & E. J. McCROSSIN.

CIGARETTE MACHINE.

No. 342,344. Patented May 25, 1886.

Fig. 12.

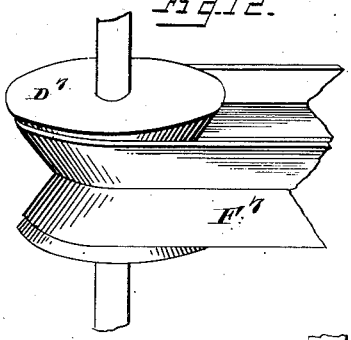


Fig. 8.

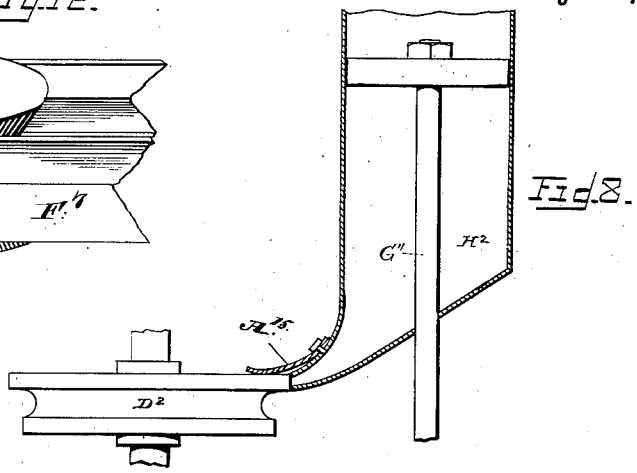


Fig. 6.

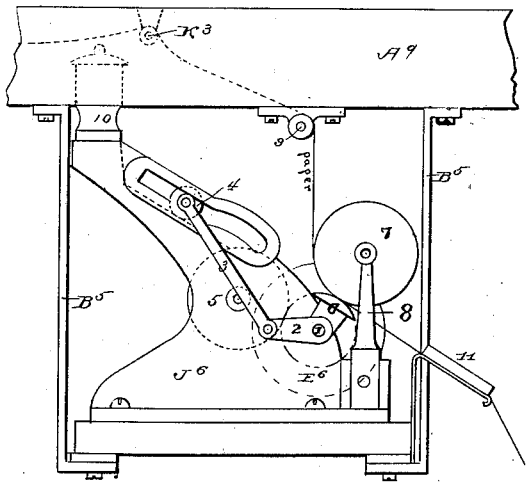
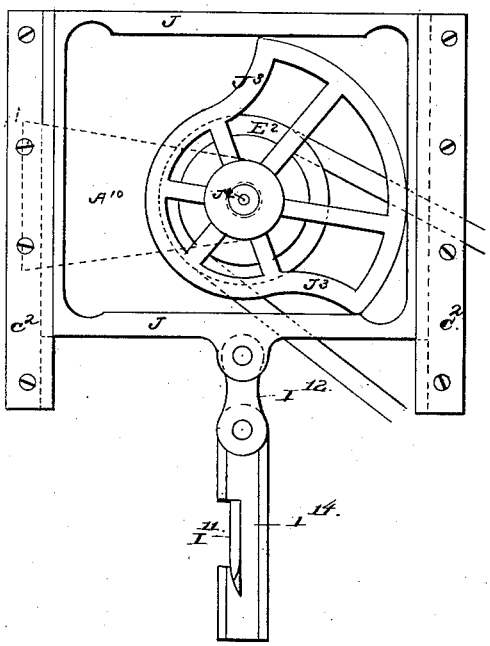


Fig. 7.



WITNESSES

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(No Model.) 8 Sheets—Sheet 7.

J. FLOYD & E. J. McCROSSIN.

CIGARETTE MACHINE.

No. 342,344. Patented May 25, 1886.

Fig. 16.

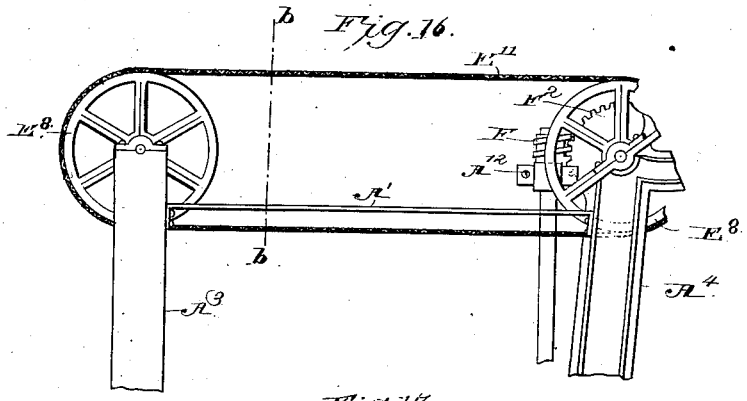


Fig. 17.

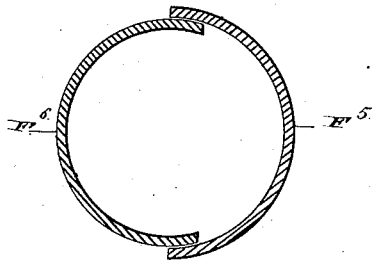
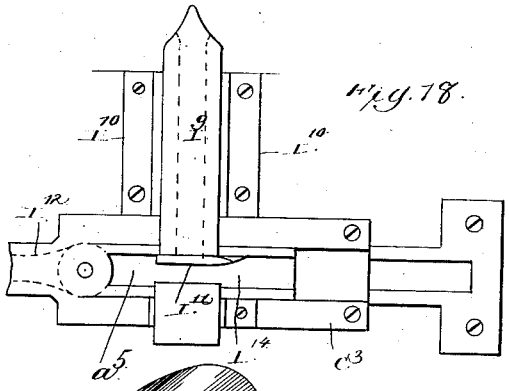


Fig. 18.



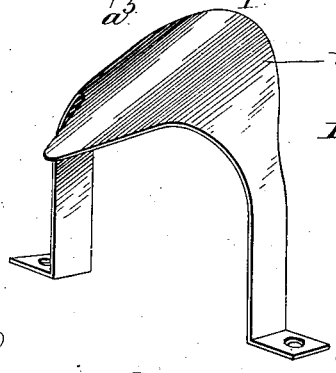


Fig. 19.

WITNESSES.

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J. FLOYD & E. J. McCROSSIN.

CIGARETTE MACHINE.

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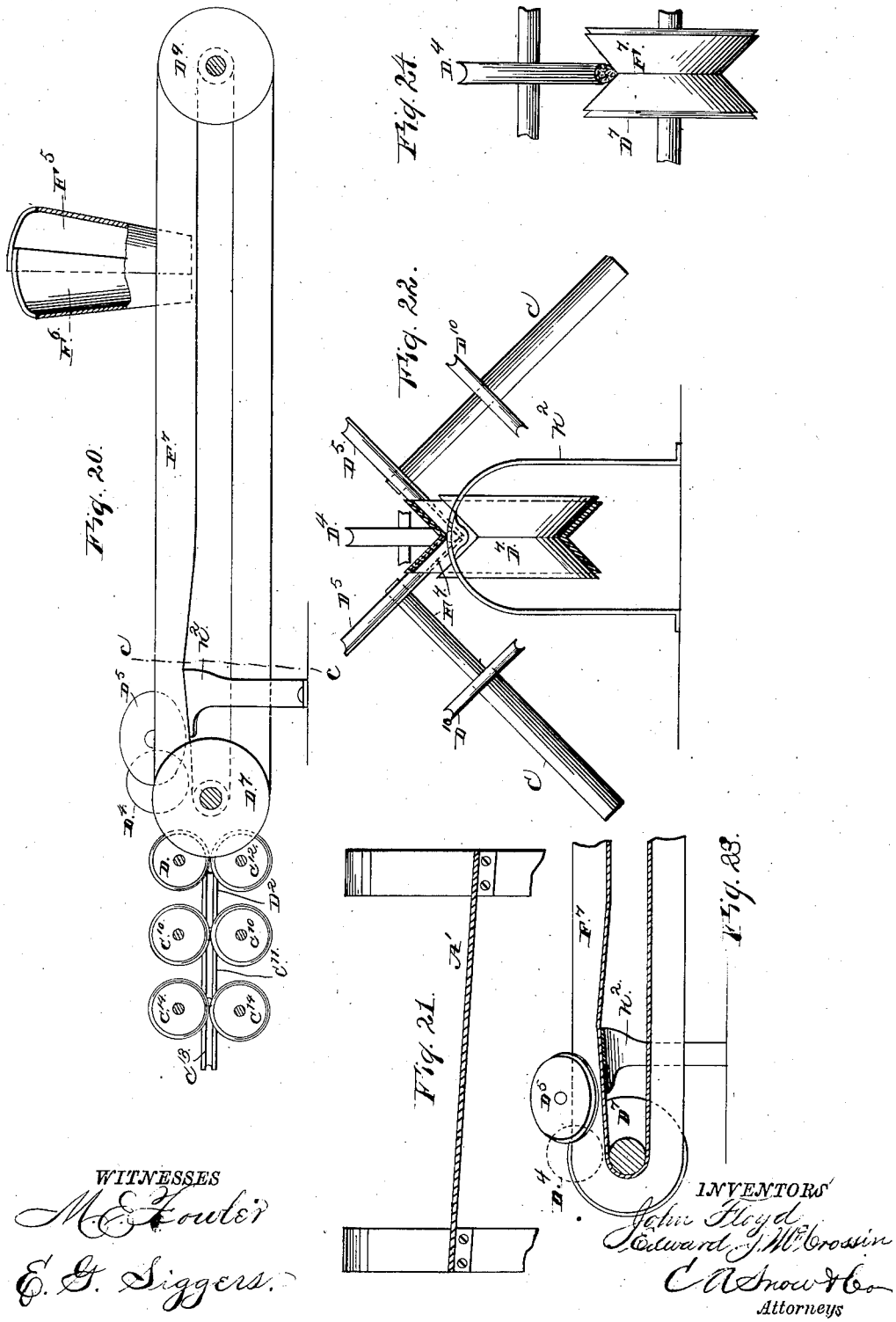

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN FLOYD AND EDWARD JAMES McCROSSIN, OF LYNCHBURG, VIRGINIA, ASSIGNORS OF ONE-THIRD TO PATRICK McCROSSIN, OF SAME PLACE.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 342,344, dated May 25, 1886.

Application filed March 7, 1885. Serial No. 158,046. (No model.)

To all whom it may concern:

Be it known that we, JOHN FLOYD and EDWARD JAMES McCROSSIN, citizens of the United States, residing at Lynchburg, in the county of Campbell and State of Virginia, have invented a new and useful Improvement in Cigarette-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to cigarette-machines, and the principal object of the invention is to provide a machine which shall uniformly and regularly feed or distribute long or short cut tobacco upon a wire-cloth belt; then separate the fibers of the tobacco by the action of a revolving brush, and cause it to fall in a uniform shower upon a second belt; then carry the tobacco along this belt until it reaches a series of grooved rollers, by means of which it is formed into a continous roll of tobacco, which roll is received by a continuous ribbon of paper; then pass the roll of tobacco and the paper between another series of rollers, grooved on their peripheries, to cause the folding of the paper around the continuous roll of tobacco; then paste the free edge of the paper to the body of the cigarette by the action of another set of rollers, to make a continuous cigarette, and, finally, cut this continuous cigarette in predetermined lengths, as hereinafter more fully explained.

Said invention consists in the improved construction, combination, and relative arrangement of parts, as will be hereinafter more fully explained, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the machine. Fig. 2^a is a side elevation of the same on the right-hand side of the line *x x*, Fig. 1; and Fig. 2^b is a side elevation on the left-hand side of said line. Fig. 3 is an end view. Figs. 4^a 4^b 4^c 4^d illustrate an elevation and section of each form of grooved roller employed in the formation of the tobacco-roll, the rolling and fitting of the paper around the same, the pasting of the paper sheet to form the completed cigarette, and the finishing of the latter. Fig. 5 is a side view illustrating the form of knife employed to sever the cigarettes. Fig. 6 is an enlarged view of the printing press or machine for stamping the trade-mark upon the continuous sheet of paper. Fig. 7 is an enlarged view in plan, showing the mechanism for actuating the knife. Fig. 8 illustrates the relative arrangement of the roller for delivering the paste to the sheet of paper and the mouth of the paste-can. Fig. 9 is a side elevation of the paper-guide and a portion of the two rollers between which the paper is received from the guide, with sections through the said guide at different points of its length. Fig. 10 is a transverse section of the fluted roller. Fig. 11 is a longitudinal and a transverse section of the wire-brush roller. Fig. 12 is a view of one of the angularly-grooved pulleys with a portion of the belt thereon. Fig. 13 is a detached end view of the first pair of grooved-roliers, which form the two sides of the tobacco-roll, the dotted lines indicating the V-shaped belt on which the tobacco is conveyed. Fig. 14 is an end view of the tobacco, showing the two sides and the top rounded. Fig. 15 is a sectional view of the two rollers which receive the paper from its guide and the tobacco-roll from the belt. Fig. 16 is a side elevation of the two feed-rollers, the feed-belt, and proximate parts, showing the relative location of the inclined plate. Fig. 17 is a horizontal section through the chutes or guards on the line *a a*, Fig. 3. Fig. 18 is an enlarged plan view of the slotted guide I^9 and the proximate parts. Fig. 19 is a detail perspective view of the guard which acts to guide the tobacco on the conveying-belt between the inclined rollers. Fig. 20 is a detached enlarged view of all the rollers and the conveying-belt. Fig. 21 is a transverse section on the line *b b*, Fig. 16. Fig. 22 is a transverse section on the line *c c*, Fig. 20. Fig. 23 is a longitudinal section through the center of the conveying-belt, showing the operation of the guard which serves to guide the tobacco between the inclined rollers. Fig. 24 is a rear end view of the discharge end of the conveying-belt, the inclined rollers being omitted.

Like letters of reference are used to indicate corresponding parts in the several figures.

Referring to the drawings, A designates legs,

connected at their upper ends by the bed-plates A^3 and supporting the entire machine, except at the feed end, where a supplemental frame, A^2, is arranged. This frame has suitable legs to rest upon the floor, and carries at its upper end a yoke, A^3, which is vertically adjustable, as shown in Fig. 2^a. Standards A^4 are secured to the bed-plates A^3, and serve as supports for one of the feed-rollers E^5, the brush-roller, and the pressure-roller, the other feed-roller E^6 being supported in the upper ends of the yoke A^3. An endless wire-cloth belt, E^{11}, is passed around the rollers E^5, and is adapted to receive the tobacco and feed it forward to the machine, an inclined metal plate, A′, being arranged between the upper and lower horizontal parts of the belt, so as to catch the dust dropped from the tobacco on the same and carry it off to any point desired. It will be observed that by reason of the adjustability of the yoke A^3 the front or feed end of the belt E^{11} may be adjusted to a higher plane than the discharge end, and thereby an inclination is given to the belt which may be found desirable to assist the feeding of the tobacco. This arrangement also enables the feed end of the machine to be adjusted to accommodate any considerable unevenness of the floor or the other supports.

On one end of the feed-roller E^5 at the discharge end of the belt E^{11}, is located a worm-wheel, F^2, Figs. 2^a and 3, with which engages a worm, F, on the upper end of the vertical shaft E^{12}, the latter receiving its motion from cord-pulley D^{12}, and stepped at each end in the boxes A^{11} A^{12}. It will be seen that the turning of the shaft E^{12} effects the rotation of the inner feed-roller E^8, which, by its connection with the other feed-roller E^5 through the belt E^{11}, keeps the entire feeding mechanism in constant movement at a regulated speed.

E^{10} designates the presser-roller, fluted or corrugated longitudinally, as shown, which is mounted in the standards A^4, and is driven by the cog-gear F^1, meshing with the gear F^3 on the extended end of the inner feed-roller E^5. This presser-roller serves to compress the tobacco upon the belt at the discharge end, and hold it there for the action of the brush-roller E^9. The latter, as shown in Figs. 1, 2^a, and 3, is provided with bristles of any suitable thickness and length, so as to have the requisite brushing action. In Fig. 10 is shown a brush-roller which may be used to advantage in this connection, it consisting of a plain core having wires wound longitudinally, so as to present the round surfaces of the wires against the tobacco on the belt. This brush-roller revolves against the presser-roller, so that should any of the tobacco adhere to the flutes or corrugations thereof the said brush-roller will clear the latter, and in this manner the possibility of clogging will be entirely obviated. The brush-roller E^9 has at one end a cord-pulley, E^5, which is connected with a similar cord-pulley, E^4, on the driving-shaft A^5. The said roller E^9 works upon the belt at the discharge end of the latter, and above the inner feed-roller E^8, and serves to scatter the mass compressed by the presser-roller E^{10}, separate the fibers of the tobacco, and at the same time, by its revolving action, draw the latter off the belt and discharge the same into the metal guards or chutes F^5 F^6, (shown only in Fig. 3,) the former, F^5, covering the brush-roller circling around over the same, and continuing down on a slant to the belt F^7, hereinafter described. The other guard or sheet, F^6, closes in between the belt F^7 and the inner feed-roller, F^8, and is of the same width as the metal guard F^5, the two guards together forming a chute or passage for the tobacco, which falls from the feed-belt E^{11} in a shower through the guards upon the belt F^7. The belt F^7 is a V-shaped belt, which, by passing around two angularly-grooved pulleys, is depressed in the center in the form of a letter V in cross-section. (See Fig. 12.) The object of this is apparent.

Heretofore it has been found necessary to either provide guards on the side edges of the belt or guards on the sides of the machine, to prevent the tobacco carried or conveyed by the belt from scattering on either side. Such expedients have been found to be unsuccessful for the purpose in view, and it is to avoid objections thereto that we have provided the peculiar form of belt shown, whereby the tobacco delivered from the main belt E^{11} through the guards F^5 F^6 will be received within the depressed center of the belt F^7, and cannot escape to either side of the same. Furthermore, by this construction of belt the tobacco received within the belt will be gathered into a smaller space than if scattered over a flat belt, and in that manner will be in a better condition to be acted upon by the rollers which form the roll.

The angularly-grooved pulleys hereinbefore referred to, and which are designated by the letters D^7 D^9, are mounted on shafts D^6 D^8, respectively, and these shafts are supported on the bed-plates A^9 of the machine in any suitable manner.

K^2 designates a sheet-brass guard, supported between the bed-plates A^9, as shown in Figs. 1 and 2^a, and having its upper edge bent or inclined upward toward the center, and sloping or curving gradually to each side, so as to guide the tobacco, which is at the central depressed portion of the V-shaped belt, under the rollers D^6 D^8. The latter are arranged at right angles to each other, (see Fig. 3,) and are mounted on the inner ends of shafts J^{10}, which work in bearings C of the frame. The peripheries of the rollers D^8 are partly grooved, so that when they meet and work together, as indicated in Figs. 3 and 13, they form two rounded sides of a complete circle. It will be seen that the point at which the two rollers meet is on a line with the center of the guard K^2, and also with the depressed portion of the belt F^7, and since the rollers work above the latter and parallel with its inclined sides the central raised portion of the guard slightly

elevates the depressed central portion of the belt, and by reason of the sloping or inclined nature of the guard causes the tobacco which is contained within, or rather upon, the said central depressed portion to be deflected or guided directly to the meeting point or edge of the two rollers D^5. In this manner the tobacco is prevented from traveling or being carried above or over the rollers by the action of the belt F^7, which would be the result if there were no means employed to guide it. Cord-pulleys D^{10} are provided on the shafts J^{10} and connect with other pulleys, hereinafter referred to, for transmitting motion to the shafts and from thence to the rollers D^5. It will be observed that as the said rollers revolve or turn edge to edge against each other the tobacco is caught and worked forward between the same, the peculiar form of the groove in the edges of the two rollers giving to the tobacco-roll a corresponding form to the rollers as it escapes from the said rollers. This form of the roll of tobacco is shown by the sectional lines in Fig. 13, having rounded sides with angular corners at the top and bottom, thereby completing two sides of the tobacco-roll, leaving the other two for the subsequent action of the remaining rollers.

D^4 designates a roller grooved on its periphery, as shown in Fig. 4^a, and mounted in a vertical position on shaft J^9, said roller being arranged above the belt F^7 and between its inclined sides. As the tobacco roll leaves the rollers D^5, it has the top and bottom corners square or angular and the two sides rounded, and said tobacco-roll continues to pass along the V-shaped belt F^7 until it reaches the roller D^4; and it is the office of the latter to round off the top of the roll, making the latter assume the form shown in Fig. 14. This is accomplished by the grooved edge of the said roller D^4 working against the top of the tobacco roll arranged within the depressed center of the belt F^7, and as the said tobacco roll leaves this roller all that remains to be done to complete the form of the same is to round off the bottom. At this point, when the tobacco roll is in the form shown and described, it receives the paper, and the two together are inclosed and rounded off in the manner which will be presently explained. The paper is wound in a continuous coil, J^7, on the roller or block J^8, which is supported detachably in the pendent hangers B^6, secured to the under side of the bed-plates A^9. To the side of the hangers (see Fig. 2^a) is secured a tension or brake spring, L, which rubs against the end of the roller-block J^8, and serves as a brake, to prevent the roll of paper from unwinding too fast. The sheet of paper after it leaves the roller-block passes through a printing-press, J^6, (shown in Figs. 2 and 6, and which will hereinafter be described,) over idlers 9 and K^3, and from thence into the enlarged mouth of the paper-guide J^{12}, which is supported in position by the rod K, Fig. 1. The guide is shown more clearly in Fig. 9, the sections thereof indicating the decreasing form of the same, and is arranged below the belt F^7 in an inclined direction, with its smaller end opening nearly on a line with the depressed center of the pulley D. (See Fig. 2^b.) As will be seen, the construction of the inlet end or mouth of the said guide enables the paper to enter the same in its flat or normal condition, and by the peculiar decreasing width of the guide shown the paper is caused to assume a curved shape, so that when it comes out from the upper end of the guide the paper has its two edges turned up in a U shape, ready to receive the continuous roll of tobacco from the roller D^4.

D C^{12} designate two vertical rollers supported on shafts C^9 C^9, which are mounted in the frames C^4 C^5, extending up from the bed-plates A^9. These rollers work edge to edge against each other, and are sufficiently near to the pulley D^7 that, as the continuous tobacco roll leaves the latter after being acted upon by the roller D^4, it will be caught by the rollers D C^{12}. The roller C^{12} is a plain grooved roller, (see Fig. 15,) and is arranged below the other roller, D, the latter being also provided with a plain groove, on each side of which are formed slots (see Fig. 4^b) to receive the edges of the paper sheet. As the paper issues from the paper-guide J^{12} in the U-shaped form described, its lower semicircular part is received within the groove of the bottom roller, C^{12}, and its two side edges stand vertically, and are received within the slots of the upper roller, D. It is between these two rollers D C^{12} that the lower corner of the tobacco roll is rounded, so as to complete the shape of the roll, the latter being received in its uncompleted state from the pulley D^7 and entering between the grooves of the two rollers. Now, since the side edges of the paper sheet are standing vertically within the slots of the roller D, the tobacco-roll is received within the paper sheet and does not touch the side edges of the latter. Thus there will be no impediment or obstacle to prevent the upper and lower rollers D C^{12}, by their combined action, completing the form of the tobacco-roll. The shape of the tobacco-roll and the position of the paper sheet is shown more clearly in the detail sectional view, Fig. 15. After leaving the rollers D C^{12} both the tobacco-roll and the paper pass between two grooved horizontal rollers, D^2 D^3, which are mounted on the upper ends of the vertical shafts C^8, the form of which rollers being shown more clearly in the sectional view, Fig. 4^c. The rollers D^2 D^3 work edge to edge against each other, the bottom edge of the roller D^3 being extended out, while the top edge of roller D^2 is extended likewise, the top and bottom edges of said rollers D^3 D^2 being cut off, so as to allow the top extended edge of the roller D^2 to revolve against the cut-out top edge of the roller D^3, and vice versa. While between the rollers D C^{12} the edges of the paper are both standing vertical, but as the paper and tobacco-roll leave them and

enter between the rollers D^2 D^3 one edge of the paper is lapped over the continuous roll of tobacco by the projecting upper or top edge of the roller D^2, and the other edge stands upright against the cut-off top edge of the roller D^3. The projecting top edge of the roller D^2 revolves against the mouth of a paste-can H^2, (see Fig. 8,) and since the latter is always filled with paste it oozes from this mouth upon the edge of the roller. The construction of the paste-can, however, will be described more in detail hereinafter, and it is only sufficient here to mention the connection which it has with the roller D^2. By the revolving action of the said roller D^2 its top projecting edge is supplied with a sufficient amount of paste, which is delivered upon the upright edge of the paper sheet, the latter being braced or supported against the cut-off top edge of the roller D^3. A tension-spring, A^{15}, is secured to the paste-can, and bears upon the top of the pasting-roller D^2, to clear off the surplus paste which may accumulate thereon. (See Fig. 8.) After leaving these horizontal rollers D^2 D^3 the tobacco-roll—which is within the paper sheet with the extended side edge of the latter pasted, as described—is caught by a pair of vertical rollers, C^{10} C^{10}, (see Fig. 2^b,) mounted on shafts C^9 C^9, and received within the grooved edges of the same, the action of said rollers C^{10}, revolving edge to edge against each other, gradually turning the pasted side edge of the sheet over the body thereof, forming the completed cigarette. This pair of grooved rollers C^{10}, in which the pasted edge of the sheet is lapped over and secured, has its grooved edges lined with cloth or other soft substance, as shown in Fig 4^a, for the purpose of drawing the continuous cigarette forward, and finishing or shaping the same in the desired form. After leaving the rollers C^{10} the completed continuous cigarette passes on between a pair of horizontal grooved rollers, C^{11}, mounted on the upper ends of vertical shafts, then between a pair of vertical rollers, C^{14}, mounted on the shafts C^9, and then between or through another pair of horizontal rollers, C^{13}. These sets of horizontal and vertical rollers are lined with cloth, similarly to the first pair of rollers, C^{10}, Fig. 4^a, to prevent tearing or injuring the body of the cigarette. These additional rollers serve to complete the form, removing all imperfections in the shape, and finishing the cigarette in the desired manner as it issues from the horizontal rollers C^{13} at the front end of the machine. We do not wish to be limited to this precise number of finishing-rollers, as the same may be increased or diminished, as desired, to suit the circumstances. Since the rollers C^{11} C^{14} C^{13} work together edge to edge on a line with the rollers C^{10}, (where the cigarette is completed,) it will be seen that the continuous cigarette-body is automatically guided in a straight line, and there will be no undue strain upon the same. This is important, inasmuch as the breaking of the cigarette would soon clog the machinery, and cause endless trouble and annoyance; but by the arrangement of the rollers, all working edge to edge against each other on a common straight line, the continuous cigarette-body will be guided in its movements, so that there can be no strain upon the same.

I^9 is a hollow guide, which is secured to the stay-piece I I^{10}, connecting with the bearing C^3. This guide (see Fig. 1) has its mouth or rear open end enlarged or made flaring, and curved or otherwise shaped to extend between the last set or pair of grooved wheels, and thus as the continuous cigarette issues from the same in its completed form it enters the mouth of the guide I^9, and is fed through the same by the action of the rollers. The front end of the guide is divided or slotted transversely, as at a^5, and is arranged above the bearing C^3, so that when the continuous cigarette has passed through the guide a sufficient distance the body of the same is exposed in the slotted portion a^5 to receive the action of a knife, I^{11}. The knife has a double edge, (see Fig. 5,) and is set on an incline in the slide I^{14}, (see Fig. 5,) which moves in guideways provided in the bearing C^3, and connects with the link I^{12}, Figs. 1 and 7. The said link is attached to the reciprocating or sliding yoke or frame J, which moves in guides or ways provided at the upper ends of the stays C^2. A revolving cam, J^3, is fitted to the upper end of the vertical shaft J^2, and is arranged within the yoke or frame J, (see Fig. 7,) so that when its largest part bears against the front and rear inner faces of said yoke the latter will be reciprocated forward and backward, and by the connection with the double-edged knife I^{11} the latter is caused to be reciprocated correspondingly. As the knife works forward, its front edge will act upon the body of the continuous cigarette exposed at the divided or slotted portion a^5 and sever the same, while, when reciprocated backward, the rear edge of the knife acts upon the body of the cigarette through the slot a^5 in a similar manner. It will be observed that by setting the knife on an incline and at an angle to the continuous cigarette, it will have a shear cut, by means of which the entire body of the cigarette will be cut through at each movement of the knife, and, furthermore, there will be no ragged edges on the ends of the cigarette when completed, for the cut will be true and even at each stroke. It will also be seen that by dividing the guide I^9, and passing the reciprocating knife with its double edge through the slotted or divided portion, the knife has a double capacity, severing one cigarette from the continous body both at its forward and backward stroke. The shaft J^2 works at its lower end in a step or bearing, A^{10}, and is provided with a pulley, E^2, which receives its motion through a belt or cord from the pulley E^3 on one of the shafts C^8. It will be understood that by decreasing or increasing the relative sizes of these two pulleys the rapidity of

the rotation of shaft J^2 may be regulated to cause the cam J^3 to reciprocate the yoke, and, through the connections described, work the knife I^{11} with a greater or less degree of rapidity. Since the continuous cigarette is fed through the rollers and out through the guide I^9 at a uniform rate of speed, all that is necessary to do when it is desired to increase or decrease the size of the cigarettes cut from this continuous body is to change the relative sizes of the pulleys E^2 E^3, this adjustment effecting a corresponding decrease or increase in the rapidity of movement of the knife I^{11}, causing the latter to cut off a shorter or longer portion of the cigarette-body, as desired. Of course after the adjustment is effected the knife will continue to sever cigarettes of the same length from the body until again changed to suit the wishes of the manufacturer.

We will now proceed to give a general description of the driving mechanism employed in setting the various parts in motion.

A^5 is the main driving shaft, on which are secured the miter-wheels H^3, (three in number,) which mesh with the miter-gears H^4 on the lower ends of three of the vertical shafts C^8. The said shafts C^8 (which are all on one side of the machine) are provided with spur-gears H^5, (see Fig. 3,) which gear into adjoining spur-gears H^5 on the other set of vertical shafts C^8, which are on the opposite side of the machine. The shafts C^8, which are thus arranged parallel, communicate motion to the grooved wheels D^2 D^3 and the four grooved wheels C^{11} C^{13}, hereinbefore mentioned, and by this connection the said wheels will run at a uniform speed. Collars H^6 are secured on the shafts C^8 and bear the weight of the same, said collars being secured in boxes H^7, which hold the shafts secure to the bars A^8, the latter being secured to stay-bars A^7, attached to lugs H^8 of the legs A. A pulley, E, on one of the shafts C^8 connects with a pulley, D^{12}, secured on shaft E^{12} for transmitting motion to the inner belt-roller E^8.

F^{12} designates a worm-screw, arranged on the driving-shaft A^5, meshing with a worm-wheel, F^{11}, on the vertical shaft F^{10}. The shaft F^{10} works at its lower end in a step-bearing, B^9, (see Fig. 2^b,) secured to the floor, and at its upper end through a hollow bearing, B^{11}, mounted on the bar A^7. A collar, B^{12}, is secured to the shaft F^{10}, and forms a bearing for the vertical shaft G^6, a cog-pinion, G, being secured to the shaft F^{10}, and transmitting motion to a cog-wheel, G^2, mounted on the vertical shaft G^3. The shaft G^3 works at its upper and lower ends in bearings or supports B^3 B^{10}, and is provided (above the cog-wheel G^2) with a cog-wheel, G^4, which is of smaller diameter and works the cog-wheel G^5, located on the shaft G^6. The latter works in a bearing, B^4, at its upper end, and is provided with a worm-screw, G^7, which engages a worm-wheel, G^8, (see Fig. 3,) supported by a shaft, G^9, in the brackets B^2. (See Fig. 2^b.) The worm-wheel engages the rack G^{10}, fitted to the plunger G^{11}, which passes vertically up into the paste-can H^2, and has its upper end provided with a cap or head to bear upon the body of paste within the can. This can is substantially rectangular in form, but may be of any other form desired, and is supported by braces C^7, Fig. 2^b, the bottom being inclined downwardly to form a spout at one side, the mouth of which spout is open to allow the paste to flow out upon the edge of the roller D^2 revolving against the same. It will be observed that the plunger is worked gradually downward through the paste-can by the action of the worm-wheel G^8 and the actuating mechanism described, and as the head or top of the plunger bears upon the body of the paste the latter is fed downward through the mouth of the spout in the can. Since the action or descent of the plunger is very slow and regular, the feeding of the paste will be correspondingly uniform, sufficient for all the purposes. It is intended that this paste-can shall contain sufficient paste to last for one day's work, (say ten hours,) and thus the head or top of the plunger, by a corresponding arrangement, will reach the bottom of the can at the close of each day. It is therefore found necessary to raise the plunger and restore the parts to their normal condition before refilling the can, and since it would be impossible to effect this by drawing on the plunger we have found it necessary to employ additional means for this purpose, which we will now proceed to describe.

H designates a cross-bar, Figs. 2^b and 3, extending across the rear side or face of the rack G^{10}, and connecting with a yoke, G^{12}, which incloses the worm-wheel G^8, and is provided with a handle, G^{13}, having two notches, as shown in Fig. 3. The rack G^{10} is slotted vertically, as shown, to receive a transverse pin on the yoke, and a pin on the shaft G^6 is adapted to engage either of the two notches provided in the handle G^{13}. In the normal position of the parts the bar H is pressed against the rear face of the rack, so as to hold the latter into engagement with the worm-wheel G^8 the handle G^{13} having its second notch received by the pin on the shaft G^6. The plunger works down in the manner described, the slot in the rack working over the pin on the yoke. When the plunger has reached the limit of its downward movement, the handle G^{13} is disengaged from the pin on the shaft G^6, and by pressing on the handle the rack is thrown back out of engagement with the worm-wheel, the first notch of the handle now receiving the pin on the shaft G^6 and holding the rack out of engagement. Then, by catching hold of the upper end of the plunger, it can be returned to its normal position at the top of the paste-can, the latter being now ready for refilling.

A^6 designates a driving-pulley loose on the main driving-shaft A^5, Fig. 2^a, and provided with one section of the clutch-coupling, F^8, the other section being grooved interiorly to

receive a feather on the shaft. A lever, F^9, is pivoted to a stay, B^8, attached to the floor, and connects with the shifting section of the clutch, and thus by operating the lever in one direction the shifting section is caused to engage the section on the band-pulley A^6, and by that means the power given or applied to the latter will be transmitted to the driving-shaft A^5 to set the machine in motion. By operating the lever in the reverse direction the clutch is thrown out of engagement, causing the band-pulley to work loose on the driving-shaft. The cord-pulleys D^{10}, on the shafts J^{10} on which the grooved wheels D^5 are mounted, are connected with cord-pulleys D^{11}, Figs. 2^b, 3, which are secured near the upper ends of shafts C^8.

C^6 is a yoke-frame secured to the bed-plates A^9, and supporting the short shafts J^4, Figs. 1 and 3, which have miter-gears H^{10} secured on the shafts C^8.

H^{11} is a spur-gear on one of the shafts J^4, outside of the miter-gear H^9, driving spur-gear H^{12} on one of the shafts C^9, as shown in Fig. 1.

I is a spur-gear on another of the shafts J^4, driving gear I^2 on the adjacent shaft C^9, and I^3 is a gear on the third shaft J^4, meshing with a gear, I^4, on the corresponding shaft C^9.

On the opposite ends of the shafts C^9 are located spur-gears, I^5, which mesh with corresponding gears I^5 directly under them, the latter gears I^5 driving the lower set of shafts C^9, with their rollers hereinbefore described.

On one of the shafts C^9 is located a grooved cord-pulley, I^6, Fig. 1, which transmits motion by a rope or cord with a pulley, I^7, on the shaft J^9, thereby imparting motion to the roller D^4.

I^8 is a spur-wheel on the shaft D^6, meshing with a spur-wheel, I^{13}, on the first shaft C^9, as shown in Figs. 1 and 3.

B^5 are hangers depending from the under side of the bed-plates A^9, and forming supports for the printing-press J^6, Figs. 2^a and 6. The ink-reservoir 10 is supplied with ink, which flows gradually down an inclined table, over which travels the inking-roller 4. The opposite ends of this roller are provided with connecting-rods 3, which are attached to cranks 2, in the ends of which is mounted the shaft 1. The latter receives its motion from the cord-pulley E^5 by a belt from a similar pulley, E^7, located on the shaft D^6. The ends of the roller 4 run in the inclined slots of the side plates, which are arranged on each side of the inclined table, over which the roller 4 travels. A distributing-roller, 5, at the bottom of the table, receives a supply of the ink carried down by the roller 4, and conveys it to the type set in the revolving arm 6. The paper, which is wound on the roller J^8, moves off the coil J^7 through a guide, 11, fitted to one of the hangers B^5, and around a roller, 7, which is supported in standards 8.

It will be observed that the operation of the main shaft 1 through the pulley E^6 causes the type-arm 6 to revolve in a circular path within the press, the type on said arm coming in contact with the distributing-roller 5, and also with the paper sheet which passes around the roller 7. The type on the arm 6 should be set to print or stamp the trade-mark of any manufacturer or aught else that may be desired. Again, the rotation of the shaft 1 should be so regulated as to cause the type-arm to strike against the paper, passing around the roller 7 at regular intervals, so that when the cigarettes are afterward cut into the lengths desired this trade-mark or print will be in the center of each one, in the manner well known.

It will be apparent that the contact of the type-arm with the ink-distributing roller 5 serves to ink the type preparatory to stamping, thereby making the type-arm self-inking. It will also be seen that the contact of the type-arm with the paper sheet against the roller 7, as the arm moves around in the circular path mentioned, is sufficient to permit the type to form a good impression on the paper.

The operation of our invention will be readily understood from the foregoing description, taken in connection with the annexed drawings. The main driving-pulley A^6 transmits motion from any suitable power to the main driving-shaft A^5, the connection between the pulley and shaft being disengaged at will by the lever and clutch described. As the driving-shaft moves, motion is imparted to one set of the vertical shafts C^8, which transmits the motion to the other set through the spur-wheels H^5. These vertical shafts C^8 are connected with and give motion to the horizontal grooved rollers C^{11} C^{13} D^2 D^3, which all move in the same direction. These vertical shafts are geared with the horizontal shafts C^9, which carry a set of vertical grooved rollers, and, as a result, we have three pair of horizontal and three pair of vertical grooved rollers, all moving in the same direction at a uniform rate of speed. One of the perpendicular shafts C^8 is connected by a pulley, E, with the shaft E^{12}, which moves the inner feed-roller, E^3, operating the belt E^{11}, and thus the feeding of the tobacco to the machine will be regulated by the movement of the shaft C^8, and thus the supply and demand for the machine will be equally balanced. The fluted roller E^{10} and the brush-roller E^9 are both moved in the same direction as the feed-belt by the connections before described, and operate to separate the fibers of the tobacco and scatter it in a shower through the guards F^5 F^6 upon the V-shaped belt. The latter, by its connection with the shaft C^9 through the gears I^{13} I^8, is moved at a uniform rate of speed in accordance with the movement of the shaft C^9, which carries one set of the grooved rollers. All the rollers, by the system of gearing described, move at a uniform rate of speed to feed the article through the machine, while the knife at the front end is regulated in its movements to suit the requirements of the trade.

We would have it understood that we do not wish to be limited to mere details of construction, as such may be changed at will without departing from the spirit or scope of the present invention.

We have given an extended description of the gearing employed to drive the various parts, not that we wish to be limited to the same, but from the fact that some certain system of gearing should be employed to keep the various parts to their relative operations, and also to work the machine at a uniform speed.

The gearing shown and described has proven to be of advantage and utility for the purposes intended, although any mechanic can readily vary the same to suit the conditions of the case.

The printing-machine, not being claimed specifically herein, will form the subject-matter for a separate application for Letters Patent.

We are aware that it is not new to employ a presser-roller and a brush-roller, both located above the feeding-belt, the brush-roller acting to dust the tobacco merely. In this construction the brush-roller did not work also against the presser-roller so as to clean the same from accumulations of matter, and thus prevent clogging.

We are also aware that it is not broadly new to arrange a brush-roller to act against a presser-roller; but in this arrangement the brush-roller was not located above the feeding-belt, and did not act to draw the tobacco off the belt. We are, however, aware that it is old, broadly, to locate a brush-roller so as to act directly against the belt. Our invention in this respect resides in the fact that the presser-roller and brush-roller are so located that the latter cleans the former from accumulations of matter, and also acts to separate the fibers of the tobacco and draw them off the belt. These two actions have never before been accomplished in one machine, so far as we are aware.

Having described our invention, we claim—

1. In a cigarette-machine, the feeding-belt constructed of open-work material, in combination with a laterally-inclined plate arranged between the upper and lower horizontal parts of the belt to catch the dust dropped from the same, as and for the purpose set forth.

2. In a cigarette-machine, the herein-described feeding device, comprising the traveling belt, a presser-roller located at the discharge end of the belt and working against the tobacco on the same, and a rotating brush mounted at one side of the presser-roller and working against the belt to separate the fibers of the tobacco and brush or draw them off the belt, and also against the said presser-roller to clean the same from accumulations of matter, as set forth.

3. In a cigarette-machine, the herein-described conveying-belt, depressed longitudinally in the center along its entire length, substantially in the form of a V in cross-section, in combination with means for supporting and actuating said belt, as and for the purpose set forth.

4. In a cigarette-machine, the herein-described conveying device comprising the pulleys angularly grooved, as described, and the belt working over the pulleys, so as to be depressed longitudinally in the center along its entire length, as and for the purpose set forth.

5. In a cigarette-machine, the herein-described feeding device, comprising the feed-rollers, the traveling belt working over the same, the yoke A^3, forming the bearings for one of the rollers, and standards depending from said yoke, said standards being vertically adjustable, for the purpose set forth.

6. In a cigarette-machine, the combination, with the conveying-belt having a depressed center, of the forming-rollers, and a guard arranged below the upper part of the belt and in front of the rollers, to prevent the tobacco carried upon the belt from riding over the rollers, as and for the purpose set forth.

7. In a cigarette-machine, the combination, with the conveying-belt depressed in the center, of the forming-rollers working together in the depression of the belt at an angle to each other, and a guard arranged to bear against the belt in such a manner as to guide the tobacco thereon between the rollers, as and for the purpose set forth.

8. In a cigarette-machine, the combination, with the conveying-belt on which the loose tobacco is carried, of a pair of grooved presser-rollers, D^5 D^5, working edge to edge against each other in the belt to form the tobacco into a continuous roll with two rounded sides, and a grooved roller, D^4, located in rear of the presser-rollers and above the belt, for rounding off the top corner of the tobacco-roll, as set forth.

9. In a cigarette-machine, the conveying-belt depressed in the center to receive the tobacco, in combination with the inclined grooved rollers working edge to edge against each other in the depressed belt, the grooves of the rollers receiving the tobacco, as and for the purpose set forth.

10. In a cigarette-machine, the conveying-belt depressed in the center to receive the tobacco, in combination with the inclined grooved rollers working in the belt and acting upon the tobacco thereon to partly form it into a continuous roll, and a grooved roller located in rear of the inclined rollers and acting against the top of the tobacco-roll as it issues from the latter, as set forth.

11. In a cigarette-machine, the conveying-belt, in combination with the grooved rollers D^5 D^5, working above the belt and acting upon the tobacco thereon to partly form it into a continuous roll, a grooved roller, D^4, located in rear of the rollers D^5 to receive the tobacco therefrom and round off the top, a guide, J^{12}, for turning up the side edges of the paper sheet, a pair of grooved rollers, D C^{12}, receiving the tobacco-roll within the paper sheet and rounding the bottom of the roll, a pair of

grooved rollers, D^2 D^3, for turning in or lapping over one side edge of the paper sheet and pasting the other edge, and a set of grooved rollers for completing and finishing the cigarette, as set forth.

12. In a cigarette-machine, the combination, with the conveying-belt, of grooved rollers for forming the tobacco into a continuous roll, grooved rollers D C^{12}, for receiving the latter within the paper sheet, grooved rollers D^2 D^3, for turning in or lapping over one side edge of the sheet and pasting the other side edge, and a set of grooved rollers for turning in the pasted portion of the sheet around the tobacco-roll and finishing the continuous cigarette, as set forth.

13. In a cigarette-machine, the conveying-belt, in combination with grooved rollers acting against the tobacco to form it into a continuous roll, grooved rollers D C^{12}, arranged to receive the paper sheet and the tobacco-roll within the sheet, grooved rollers D^2 D^3, for pasting the latter, and a set of grooved rollers for turning in the pasted portion of the sheet around the tobacco-roll and finishing the completed cigarette, as set forth.

14. In a cigarette-machine, the combination, with the tobacco-conveying belt depressed in the center, of grooved rollers D^5 D^5 D^4, working above the belt for forming the tobacco into a continuous roll, rollers D C^{12}, having grooves to receive the roll of tobacco within the paper sheet, grooved rollers D^2 D^3, for pasting the latter, and a set of grooved rollers for turning in the pasted portion of the sheet around the tobacco-roll and finishing the continuous cigarette, as set forth.

15. In a cigarette-machine, the paste-can, in combination with the set of grooved rollers working edge to edge against each other and receiving the paper sheet to be acted upon between the same, one of the rollers working across the mouth or outlet of the can to receive a supply of paste and deliver it to the paper sheet, as set forth.

16. In a cigarette-machine, the combination of the herein-described instrumentalities, comprising the conveying-belt, the pair of presser-rollers D^5, to partly form the tobacco into a continuous roll, a grooved roller, D^4, for rounding off the top corner of the roll of tobacco, a guide, J^{12}, for turning up the edges of the paper sheet, a pair of grooved rollers, D C^{12}, to receive the paper sheet and the tobacco-roll, a pair of rollers, D^2 D^3, for turning in one edge of the paper sheet and pasting the other edge, and a set of rollers for completing and finishing the continuous cigarette, as and for the purpose set forth.

17. In a cigarette-machine, the paste-can having its mouth or outlet open, and means, substantially as described, for feeding the paste through the outlet, and a pair of grooved rollers arranged to receive the tobacco-roll and the inclosing sheet of paper and turn in one side or edge of the latter over the tobacco-roll, one of said rollers working against the mouth or outlet of the can to deliver a supply of paste to the other side or edge of the paper sheet, as and for the purposes set forth.

18. In a cigarette-machine, the conveying-belt, in combination with a pair of grooved rollers, D C^{12}, working edge to edge against each other and adapted to receive the tobacco-roll from the belt within their grooves, a guide to form and deliver the sheet of paper to the rollers, substantially in V form, one of said rollers being provided with slots to receive the upright side edges of the paper sheet, so as to allow the introduction of the tobacco-roll within the same, as set forth.

19. In a cigarette-machine, the conveying-belt, a pair of grooved rollers, D C^{12}, working edge to edge against each other, and adapted to receive the tobacco-roll within their grooves, and a guide to form and deliver the sheet of paper to the grooves of the rollers in V shape, the said rollers being constructed, substantially as described, to hold the side edges of the sheet in a vertical position, so as to allow the introduction of the tobacco-roll within the paper sheet, as set forth.

20. In a cigarette-machine, the combination, with the cigarette-making mechanism, of the herein-described pasting apparatus, comprising the can, a plunger located within the same and traveling vertically to feed the paste downward, a rack provided on the plunger, a gear, G^8, engaging with the rack, and a worm, G^7, for operating the gear-wheel, said worm being operated by connection with the other parts of the machine, as set forth.

21. The combination, with the cigarette-making mechanism, of the herein-described pasting apparatus, comprising the can, a plunger for feeding the contents thereof downward, a rack provided on the plunger, a gear-wheel for engaging the rack, and an operating-handle connecting with the plunger, to throw its rack out of engagement with the gear-wheel, as set forth.

22. In a cigarette-machine, the combination, with the conveying-belt, of devices for forming the tobacco into a continuous roll, means for appropriately printing or stamping the sheet at regular intervals, the pasting apparatus, devices for receiving the tobacco within the paper sheet and delivering paste to the sheet, mechanism for completing and finishing the continuous cigarette, and severing devices for severing the continuous cigarette, as set forth.

23. The combination, with the cigarette-making mechanism, of the herein-described pasting apparatus, comprising the can, a plunger to feed the contents thereof downward, mechanism, substantially as described, for automatically working the plunger by the action of the other parts of the machine, and an operating-handle for throwing the plunger out of gear with the said mechanism when the plunger has reached the limit of its downward movement, for the purpose set forth.

24. The combination, with the cigarette-making mechanism, of the herein-described pasting apparatus, comprising the can, a plunger for feeding the contents thereof gradually downward, a rack provided on the plunger, and gearing for working the rack, said gearing connecting with and being driven by the other parts of the machine, and an operating-handle for throwing the rack on the plunger out of engagement with said gearing when the limit of the downward movement is reached, for the purpose set forth.

25. The combination, with the cigarette-making mechanism, of the paste-can, a slotted plunger for feeding the contents downward, gearing for working the plunger, and an operating-handle having a pin-and-slot connection with the plunger, as set forth.

26. In a cigarette-machine, the combination of the herein-described cutting apparatus, comprising a base-piece or slide carrying a knife extending upwardly in an inclined line across the path of the continuous cigarette, so as to sever the same with a shear cut, and means for operating said slide, as set forth.

27. In a cigarette-machine, the divided or slotted guide I^9, in combination with the slide or base-piece I^{14}, working below the guide, and the knife set on an incline in the slide and working through the slotted portion of the guide, as set forth.

28. In a cigarette-machine, the herein-described cutting apparatus, comprising the reciprocating slide and the knife extending upwardly therefrom in an inclined line and provided with a double cutting-edge, both edges of the knife acting alternately upon the cigarette-body, as set forth.

29. In a cigarette-machine, the divided or slotted guide through which the continuous cigarette passes, in combination with an inclined knife having a double cutting-edge and working through the slot of the guide, both edges of the knife acting alternately upon the cigarette-body, and means for operating the said knife, as set forth.

30. In a cigarette-machine, the combination of the reciprocating knife I^{11}, the slide I^{14}, the link I^{12}, the yoke or frame J, the vertical shaft J^2, and the cam J^3 on the upper end of the shaft within the frame, as set forth.

31. The combination, with the cigarette-making mechanism, of the herein-described pasting apparatus, comprising the can, a plunger for feeding the contents thereof downward and having the lower end slotted, a rack provided on the plunger, a gear-wheel engaging with the rack, and a handle-bar, H, provided with a transverse pin to fit in the slot of the plunger, said bar being adapted to hold the rack into engagement with the gear-wheel and arranged to be shifted to disengage the parts as set forth.

32. In a cigarette-machine, the paste-can, in combination with the grooved pasting-rollers working against each other and receiving the article to be acted upon between the same, one of the rollers working against the mouth or outlet of the can, and a wiper attached to the latter and pressing against the face of the roller to clear off the surplus paste that may accumulate thereon, as set forth.

33. In a cigarette-machine, the combination, with the paste can or reservoir, of the set of grooved rollers, the grooves of which register with each other to allow the reception of the paper sheet and the tobacco-roll, one side or edge of which is held in a vertical position against one of the rollers, while the other side or edge is turned over by the other roller to allow the latter to apply paste to the vertical edge of the sheet, as set forth.

34. In a cigarette-machine, the combination, with the grooved rollers D C^{12}, for receiving the paper sheet and the tobacco-roll, of a pair of rollers, D^2 D^3, for turning in one edge of the paper sheet and pasting the other edge, and the finishing-rollers, as set forth.

35. In a cigarette-machine, the combination, with the set of grooved rollers for receiving the paper sheet and the tobacco-roll and turning in one edge of the paper sheet and pasting the other edge, of the set of rollers for turning over the pasted edge and completing the cigarette, as set forth.

36. In a cigarette-machine, the combination, with the reciprocating knife, of an open frame or yoke connecting with the same, and a cam arranged within the yoke to operate alternately against the front and rear inner faces thereof, as and for the purpose set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

JOHN FLOYD.
EDWARD JAMES McCROSSIN.

Witnesses:
W. R. MUSSER,
J. B. NOWLIN.