3 Sheets—Sheet 1.

M. J. LOPEZ Y MANOZ.

CIGAR MACHINE.

No. 48,141. Patented June 6, 1865.

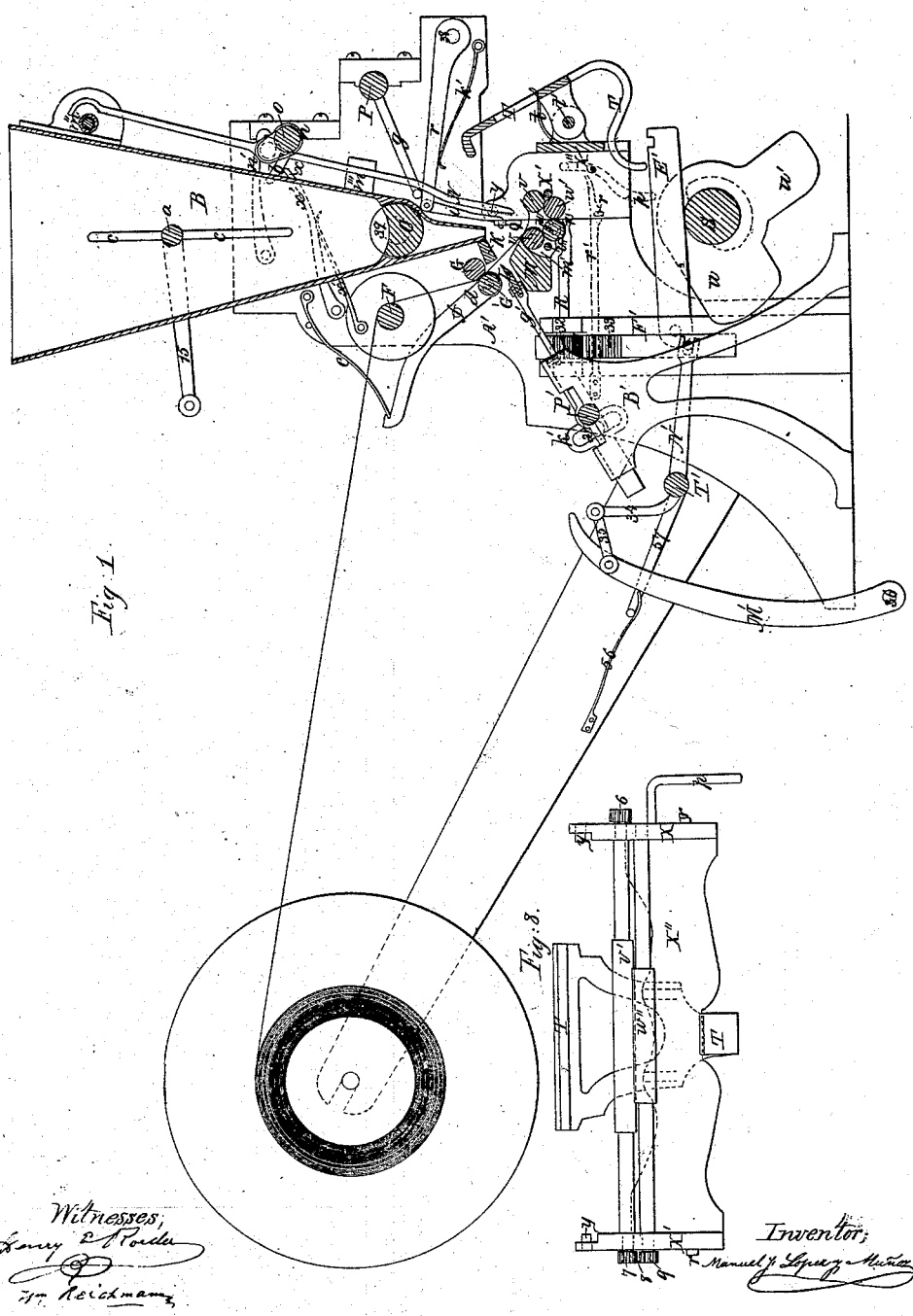

Fig. 1.

Fig. 3.

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3 Sheets—Sheet 2.

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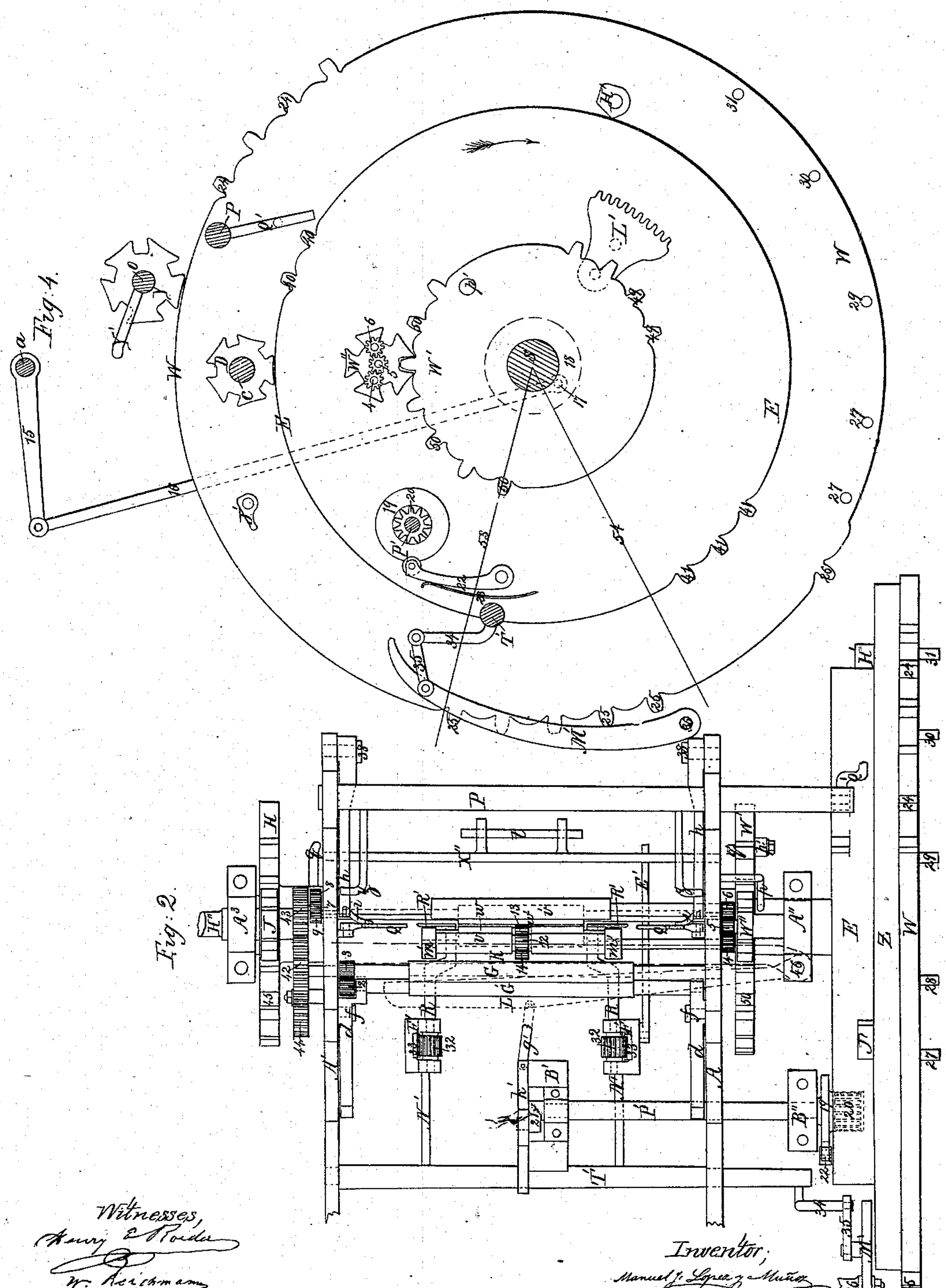

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3 Sheets—Sheet 3.

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Fig: 6.

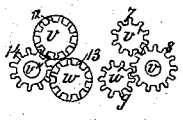


Fig: 7.

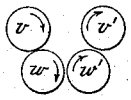


Fig: 5.

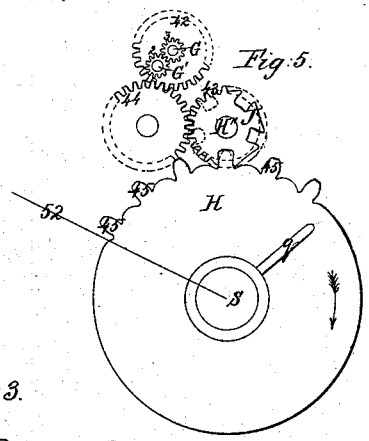
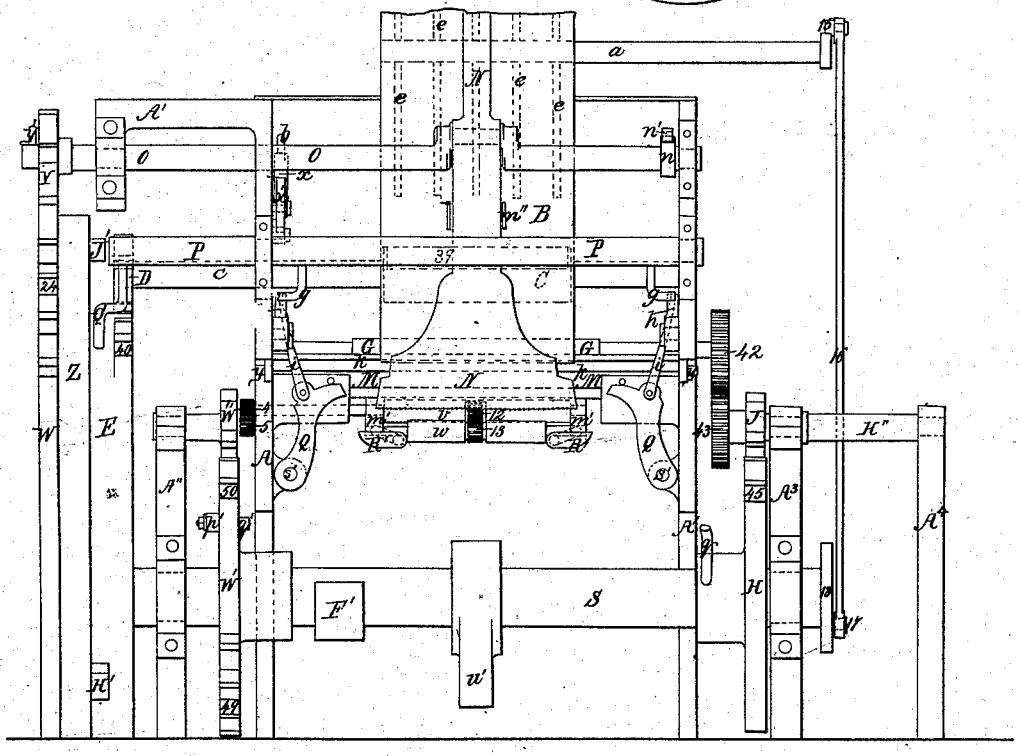


Fig: 3.



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UNITED STATES PATENT OFFICE.

MANUEL J. LOPEZ Y MUNOZ, OF HAVANA, CUBA.

IMPROVEMENT IN MACHINES FOR MAKING CIGARETTES.

Specification forming part of Letters Patent No. **48,141**, dated June 6, 1865.

To all whom it may concern:

Be it known that I, MANUEL J. LOPEZ Y MUÑOZ, of the city of Havana, in the Island of Cuba, have invented a new and Improved Machine for Making Cigarettes; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure I represents a longitudinal section of the machine. Fig. II is a plan or top view of the same, with some of the upper parts removed. Fig. III is an end view of the same. Fig. IV shows the driving-wheels and shafts through which the different motions are obtained. The other figures show details, and will be referred to in the description.

In the accompanying drawings, A A′ represent the side frames, upon which a hopper, B, is fastened to contain the tobacco and for making the cigarettes. Into this hopper B a shaft, *a*, is fitted, provided with prongs or points *e e*, projecting upward and downward, to shake up the tobacco, so as to allow the same to fall easily downward. For this purpose a vibratory motion is communicated to said shaft *a* through an arm, 15, fastened to the end of said shaft, and connected through the rod 16 with a pin, 17, attached to the eccentric wheel 18, secured on the end of the main driving-shaft S. In the lower part of this hopper B a drum, C, is placed, provided with a cavity, 39, containing the exact quantity of tobacco necessary for one cigarette. The shaft of this drum runs in suitable bearings in the frames A and A′, and is provided at its end with a pinion, D, capable of sliding on the smooth surface of a ring, E, fast on the driving-shaft S, and at the same time capable of being turned around by teeth 40 and 41, attached at different points on the circumference of this ring E.

F is a guide-pulley, provided with large flanges for the purpose of guiding the paper for the cigarettes into the machine. This pulley runs on centers attached to the frames A and A′.

G G′ are the feeding-rollers to bring the paper into the machine. The roller G runs in bearings in the frames A A′, and is provided at one end with a pinion or teeth wheel, 42, to give motion to the same, as will be hereinafter described. The roller G′ runs in bearings on the end of levers *d d*, turning on centers *f* fixed to the frames A A′. The other end of said levers *d d* are acted upon by springs *c c*, so as to press the surfaces of the two rollers together to produce the required friction on the paper. A small pinion, 3, on the roller G, meshing into a corresponding pinion, 2, on the roller G′, communicates the required motion to the latter.

On the driving-shaft S a wheel, H, (see Figs. II, III, and V,) is fastened, having on part of its circumference teeth 45 cut or attached. A pinion, J, constructed similar to the pinion D, is made to work upon said wheel H, and capable of being turned around by the said teeth 45. This pinion J is fast on a shaft, H″, running in bearings A^4 and A^3. On the end of this shaft H″ a pinion or teeth wheel, 43, is fastened, working into an intermediate wheel, 44, which latter meshes into the pinion 42 fast on the roller-shaft G, and communicates in that manner the desired motion to said shaft G, and which latter communicates through the pinions 3 and 2 motion to the roller G′. (See Fig. V.)

K is the cutting-bar, and L is the cutting-knife, acting together to cut the paper after the desired quantity necessary for a cigarette has been moved into the machine. This cutting-bar K is firmly secured to the frame A′, and to a frame, A″. (See blue lines in Fig. II.) The knife L turns on a pin, 46, fast to the frame A″, and is operated by a rod, *g′*, forming a connection between the said knife L and a sliding bar, *k′*, working in suitable guides in the frame B′, and operated by the crank 21 on the end of the shaft P′. This shaft P′ runs in bearings in the frames B′ and B″, and is provided on its other end with a disk-wheel, 19, and a pinion, 20.

Against the wheel Z, fast on the driving-shaft S, a segment, L′, is fastened in such a position that by the revolution of the shaft S said segment L′ will mesh into the pinion 20, turning thereby the same, and consequently the shaft P′ and crank 21, and through which motion will be given to the sliding bar *k′*, which said motion is communicated to the knife L, which latter, acting against the edge of the cutting-bar K, will cut off that part of

the paper which has been pushed into the machine.

To lock the shaft P′, and to prevent the motion of the knife L at all times, except when operated by the action of the segment L′, a lock-lever, 22, acted upon by a spring, 23, and provided with a small pulley at its end, is arranged, working against the surface of the disk-wheel 19 during the revolution of the shaft P′, and fitting into a recess made in said disk-wheel, through which the same and consequently the shaft P′, bar *k′*, and knife L are held fast.

v w and *v′ w′* are the forming-rollers. The rollers *v* and *w* turn in bearings *m′* fast on the brace-bar M. The shaft of the roller *v* is extended and passes through the frame A, and is provided at its end with a pinion, 4, meshing into a pinion, 5, from which motion is communicated to the roller *v*. Near the middle of the roller *v* a pinion, 12, is arranged, meshing into a pinion, 14, fast on a small shaft, *v″*, running likewise in bearings in the projection *m′*. This pinion 14 meshes into a pinion, 13, arranged near the middle of the roller *w*, and communicates the motion given to the roller *v* to this roller *w*. The circumferences of the rollers *v* and *w* nearly touch each other, and the outside circumferences of the pinions 12 and 13 are made to correspond with the circumferences of their respective rollers. (See Fig. VI.) The rollers *v′* and *w′* run in suitable bearings in the swinging frame X X′. The shaft of the roller *v′* extends through the frames and receives at one end the pinion 6, which meshes into the pinion 5, from which it receives the required motion. On the other end of the shaft of roller *v′* a pinion, 7, is attached, meshing into a pinion, 8, which latter works the pinion 9, attached on the end of the shaft of the roller *w′*, and communicates thereby the desired motion to said roller *w′*. (See Figs. VI, VIII.) The rollers *v* and *v′* receive their motions from the pinion 5, meshing into their respective pinions 4 and 6, as above described. This pinion 5 is fixed to a pinion, W″, and turns, together with the same, upon a stud fastened in the frame A″. (See Figs. III and IV.) The pinion W″ is made to work into the teeth 50 49, as well as upon the surface of the wheel W′, fastened on the driving-shaft S, and is constructed similar to the pinions D and J.

The swinging frames X X′ are fastened to the frames A A′ by means of the pins *y*, (see Figs. III and VIII,) capable of swinging upon said pins, and are held in the desired position against the frames A A′, and so that the pinion 6 will be in gear with the pinion 5 by means of spring-catches *r′* attached to the frames A A′, acting upon pins or projections *r* attached to the frames X and X′. The frames X X′ are firmly connected together by means of the bar X″.

To the hub of the wheel H an arm, *q*, is attached, and to the wheel W′ a pin, *q′*, is attached, which, during the revolution of the said wheels, come in contact with the spring-catches *r′*, so as to throw the same clear of the projections *r*, and allow thereby the frames X X′ to be moved on the studs *y*. This motion is produced by means of an arm, *p*, fastened to the frame X, coming in contact with a pin, *p′*, fastened to the wheel W′.

To the bar X″ a bent lever, T, is hinged, capable of turning on the center pin, *t′*, and acted upon by a spring, *t*, fast to the bar X″, pressing said lever T outward and downward. The upper end of the lever is made nearly as wide as the cigarette is long, (see Fig. VIII,) and shaped so as to fit loosely between the rollers *v* and *v′*. The lower end of this lever T is acted upon during the revolution of the driving-shaft S by projections or cams U and U′ attached to said shaft S.

E′ is a lever turning loosely on a fixed center, and acted upon by a cam, F″, attached to the shaft S in such a manner that through said cam this lever E′ shall take firm hold of the bar X″ and hold the same, and consequently the frames X X′, close to the frames A A′ in the required position until the spring-levers *r′* are thrown clear of the projections *r*, when the surface of this cam F″ will likewise allow the lever E′ to fall by its own weight clear of the bar X″, and allow the frames X X′ to be moved in the manner above described.

N is the forming-lever attached to a crank-shaft, O, and guided at its upper end by a friction-roller, *m″*, between projecting flanges, and near its lower part by flanges *m‴* at its sides and attached to the hopper B. The crank-shaft O, which operates this forming-lever N, turns in suitable bearings in the frames A A′, and is provided at its end with a pinion, Y, similar in construction to the pinions J and D. This pinion moves upon the surface of a wheel, W, attached to the driving-shaft S, and is capable of being worked by teeth 24, 25, and 26, attached at different points around the circumference of the wheel W. Through these teeth the crank-shaft O receives motion, either to make a full revolution or only to make part of a revolution, and consequently a longer or shorter amount of motion will be communicated to the forming-lever N, as may be required, for the purpose hereinafter explained. To this shaft O a small arm, *b*, is attached, acting upon a spring-lever, *x*, and acted upon by a spring, *x′*, for the purpose of bringing the shaft O, and consequently the forming-lever N, back again into its upward or top position whenever only a motion less than the full motion has been communicated to said lever N or to the shaft O. A cam, *n*, provided with one tooth on which a catch-lever, *n′*, works, is attached to this shaft O, for the purpose of stopping the upward motion of the lever N, and to prevent the same being forced up beyond the fixed position by the action of the spring-lever *x* against the arm *b*.

Outside of the pinion Y an arm, Y′, is firmly attached to said pinion or to the end of the

shaft O, which comes in contact with pins or projections 27, 28, 29, 30, and 31, fixed on the side of the wheel W, and through which, said pins acting against the arm Y′, a short motion is communicated to the forming-lever N.

R R are small shafts supported in bearings in the frames F′ F′, situated at each end of the cigarette when in the machine. The inner end of these shafts is bent and provided with a flat-pointed lever, R′, the upper surface of which, when at rest, will be just below the paper of the cigarette. Between the bearings of this shaft a pinion, 32, is fastened to said shaft R, working into a rack, 33, guided in the frame F′. The lower end of the rack 33 is attached to a lever, N′, fast on a shaft, T′. This shaft T′ runs in bearings in the frames A A′, and is provided at its end with an arm, 34, connected through the rod 35 with a lever, M′, moving on a fixed center, 36, attached to the frame of the machine.

To the side of the wheel Z a projection, J′, is attached, which, during the revolution of said wheel, comes in contact with the lever M′, communicating to the same the desired motion, which is communicated to the shaft T′, and through its arms N′ N′ to the racks 33, which latter, acting in the pinions 32 fastened to the shafts R, communicate to said shafts, and consequently to the levers R′, the required motion—about one-half of a revolution.

Q Q are levers turning on fixed centers *s*′, fast to the frames A A′. These levers are situated near the center, between the rollers *v v*′ on each side, and clear of the cigarettes. The heads of these levers are placed a little on one side of the levers R′, sufficiently that they may clear each other in their respective motions. This lever Q is connected through the rod *i* with a spring-lever, *h*, turning on a fixed center, 38, in the frames A and A′, and acted upon by a spring, *h*′, so as to keep said lever, as well as the rod *i* and lever Q, upward. The levers *h* are acted upon by arms *g*, fast to a shaft, P, by which the levers *h*, and consequently the levers Q, are moved downward against the action of the springs *h*′. The shaft P runs in suitable bearings in the frames A A′, and is provided at its end with an arm, Q′, which latter is brought in contact with a projection, H′, attached to the side of the wheel Z during the revolution of said wheel, and whereby the desired motion is given to said shaft P, and consequently to the arms *g*, to operate the levers *h*, and consequently the levers Q, as above described.

The wheel Z may be provided with teeth and operated by a pinion, to give the desired motion to the shaft S, or the same may be turned by any other and convenient device.

The operation of the machine is as follows: Motion being given to the shaft S in the direction indicated by the arrow, Figs. IV and V, the feeding-rollers G G′ have drawn part of the paper necessary for making one cigarette into the machine by the action of the teeth 45 on wheel H, upon the pinion J, which, as above described, operates said feeding-roller through the gearing 43, 44, and 42. At the same time the forming-rollers have been put in motion by the action of the teeth 50 on the wheel W′ upon the pinion W″, to which latter the pinion 5 is connected, operating the pinions 4 and 6, and through the same the forming-rollers *v w* and *v*′ *w*′, as above described. The paper used for making the cigarettes is taken from an endless roll of paper running freely in supports some distance from the machine. The same passes over the guide-roller F and between the feeding-rollers G G′, between the cutting-bar K and the knife L, over the distance or brace bar M, and upon the rollers *v v*′. When the shaft S has revolved through that part of the circle to the line marked 52 the required quantity of paper for one cigarette has been moved upon the forming-rollers, and the teeth 45 of the wheel H come then out of gear with the pinion J, and consequently the feeding of the paper ceases, being then only held fast between the surfaces of said feeding-rollers. The motion of the forming-rollers continues some little time to get the paper to lie smooth and even upon the rollers *v v*′. When the driving-shaft S has been turned to the line marked 53, Fig. IV, the motion of the forming-rollers is stopped, on account of the tooth 50 coming clear of the pinion W′. In that position the teeth 25 on the wheel W operate the pinion Y on the end of the crank-shaft O, and act upon the same until the revolution of the shaft S has passed the space from line 53 to line 54, causing thereby the shaft O to make a full revolution, and consequently giving the same amount of motion to the forming-lever N. By this motion of the lever N the same has been moved upon the paper and downward between the forming-rollers *v w* and *v*′ *w*′, carrying the paper, which is still held firmly between the feeding-rollers G G′, downward, and thus forming a cavity in the paper, or bending said paper into the space formed by the forming-rollers. The latter part of the revolution of the crank-shaft O has brought the forming-lever N again out of the space between the forming-rollers and clear of the same, as well as of the end of the paper. The teeth 41 of the wheel E act now upon the pinion D, which latter operates the drum C in the hopper B and turns said drum around, so that the tobacco which has fallen in the cavity 29 in said drum is brought downward and allowed to fall out of the bottom opening of the hopper B into the bent part or cavity of the paper between the forming-rollers. During this revolution of the driving-shaft the arm U on said shaft has likewise moved, so as to act now against the lower part of the lever T, forcing thereby the upper end of said lever inward toward the forming-rollers, and acting thus against the back of the forming-lever N, so as to move the same over the space between the rollers *v v*′ and over the tobacco which has fall-

en upon the paper. The tooth 26 on the wheel W acts now upon the pinion Y, moving thereby the crank-shaft O about one-fifth around, whereby the crank is moved nearer toward the hopper and moved somewhat downward. By this operation the forming-lever is brought likewise lower down upon the tobacco, and directly over the middle of the same. The pin 27 on the side of the wheel W operates now the arm Y′ on the end of the crank-shaft O, causing thereby, through said crank-shaft, the forming-lever N to move downward, so as to act upon the tobacco which has fallen upon the paper and distribute the same evenly over its whole length. While the lever N acts thus upon the tobacco the same holds likewise the paper fast against the rollers *v w*. At the same time this operation is performing, the teeth of the segment L′ come into the teeth of the pinion 20, fast to the end of the shaft P′, operating thereby said shaft, as well as the crank 21, and consequently the sliding bar *k′* and rod *g′*, so as to move the knife L against the lower cutting-edge of the cutting-bar K, and cut thereby the paper through. The completion of the revolution of the shaft P′ will bring the knife L back again into its original position, as represented in the drawings, and the lock-lever 22, which during the revolution was forced out of the recess in the disk-wheel 19, falls again into the recess, and thus locks the shaft P′, as well as all parts connected with the same, during the remaining part of the revolution of the machine. The forming-lever N is then moved again upward, when the pin 28 acts again upon the arm Y′, and consequently upon the forming-lever, so as to move the same again downward. During this motion of the forming-lever the same has taken hold of the end of the paper and turned or laid the same over the tobacco. The teeth 49 of the wheel W′ come now in gear with the pinion W″, whereby the forming-rollers *v w v′ w′* are again set in motion, and which, by their action, roll up the cigarette. The action of the cam or arm U against the lower end of the lever T causes the upper end of said lever T to press against the back of the forming-lever N and keeps thereby the lower end of said lever N close to the forming-roller *v*. During the rolling of the cigarette the pins 29, 30, and 31 act one after the other upon the arm Y′, and consequently upon the forming-lever N, giving the same each time a slight downward motion, thereby pressing each time the cigarette slightly together at the side nearest the roller *v* and assist the rolling up of the same. The lower edge of the forming-roller N is slightly serrated, and its inner and lower surface is covered with an elastic and rough surface—such as india-rubber, cloth, or hair—to take easily hold of the paper without tearing the same. During each action of the pins 27, 28, 29, 30, or 31 upon the crank-shaft O and lever N through the arm Y′ the arm *b* presses upon the spring-lever *x*, forcing the same downward, whereby, as soon as either of the above-mentioned pins has finished its action upon the arm Y′, this crank-shaft O will be acted upon by this spring-lever *x* through the arm *b*, turning said shaft O back again, so as to bring thereby the forming-lever N back again into its top position until stopped by the lever *n′* coming against the tooth on the cam *n*, fast to said shaft O. When the teeth 49 have passed the pinion W″ the motion of the forming-rollers is stopped. The projection or cam U′ acts now upon the lower end of the lever T, moving thereby the upper end of said lever between the rollers *v v′* and upon the rolled cigarette, so as to hold the same fast between its end and the rollers *w w′*. The cigarette, which is now held tight, as above described, rests with its ends upon the small levers R′ R′. The projection H′ comes now in contact with the arm Q′, fast to the end of the shaft P, operating the same in such a manner that the arms *g* will press upon the levers *h*, so as to move the same downward, and consequently likewise the levers Q, by which operation the upper part of the ends of the paper of the cigarette is pressed downward and inward, and closed over the tobacco through the ends of said levers Q. Before the ends of the levers Q are moved away and are still holding the paper ends pressed down the projection J′ acts against the lever M′ and operates the same, so as to move, through its connection, the shaft T′, which latter, through its arms N′, operates the racks 33, pinions 32, and consequently the shafts R and their levers or arms R′, communicating thereby to said shafts about one-half revolution, by which operation these arms R′, which, as above described, were situated just below the cigarette, are turned around, so as to move nearly upon the said cigarette, and during which motion the ends of the paper will be folded up (the ends of the levers Q having left the cigarette) and turned over that part of the paper which has been turned down over the tobacco by the action of the levers Q, and thereby tightly closing up the ends of the cigarette. The spring *h′*, acting against the under side of the lever *h*, has forced said lever, and consequently the levers Q, up again into their original position, and the spring 56, acting against the arm 57, fast to the shaft T′, forces likewise said shaft and its connections, as well as the levers R′ R′, back again into their original position. The arm *q* on the hub of the wheel H, as well as the pin *q′* on the wheel W′, come now in contact with the spring-levers *r′*, so as to throw the same clear of the projections *r* on the sides of the frames X X′, and the cam F′ on the driving-shaft S has moved away from under the lever E′, allowing thereby said lever to fall downward away from the connecting-bar X″, by which operations the frames X X′ will be left loose upon the pins or studs *y*. The projection *p′* on the wheel W′ comes now in contact with the arm *p* on the side of the frame X, moving thereby the said frames, with all parts attached to the same, around the central studs, *y*, by which operation the forming-rollers *v′ w′*

are moved away from the forming-rollers *v w* sufficiently to allow the finished cigarette to fall out at the bottom. The teeth 24 on the wheel E act then upon the pinion Y at the end of the crank-shaft O, operating thereby the forming-lever N, so as to push first the cigarette out of the machine and then to bring said forming-lever into its original position. The frames X X′ fall then by their own weight again into the spring-catches *r′*, and the cam F″ acts again upon the lever E′ to force the same up to lock the cross-bar X″, and consequently the frames X X′, when the machine is again in position to begin the formation of another cigarette.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement of the feeding-rollers G G′, connected together and pressed together in the manner specified, and worked by means of gearing, in the manner and for the purpose substantially as described and set forth.

2. The arrangement and combination of the cutting-bar K and knife L, worked by means of a segment, L′, in the manner and for the purpose substantially as set forth.

3. The manner of working the forming-rollers *v w* by the pinions 12 13, in combination with the pinion 14, when said pinions 12 13 form part of the surface of said rollers.

4. The arrangement of the frames X X′, swinging upon central studs, *y*, attached to the frames of the machine, and secured in their place during the operation of the machine by spring-levers *r′* and a lever, E′, acted upon by a cam, F′, in the manner specified.

5. The arm *q* and the pin *q′*, or their equivalent, acting upon the spring-levers *r′*, for the purpose of disengaging the same, in combination with the pin or projection *p′*, acting upon an arm, *p*, fast to the said frames X or X′, for the purpose of swinging said frames around central studs, *y*, the whole operating together in the manner and for the purpose described.

6. The wheel W′, acting upon the pinion W″, and the pinion 5, operating, through the pinions 4 and 6, the forming-rollers, in the manner substantially as described.

7. The forming-lever N, attached to a crank-shaft O, and operated by teeth 24 25 26 and pins or projections 27, 28, 29, 30, and 31, in the manner and for the purpose substantially as specified.

8. The arm *b*, in combination with the spring-lever *x*, and the cam *n*, in combination with the lever *n′*, acting on the crank-shaft O and the forming-lever N, in the manner described and set forth.

9. The lever T, acting upon the forming-lever N, and operated by arms or cams U and U′, substantially as specified.

10. Holding the rolled cigarette firmly in its place while the ends of the paper are closed by means of the lever T, operating in the manner specified.

11. The lever Q, operated in the manner specified, or its equivalent, for the purpose of turning down the upper part of the paper at the ends of the cigarettes.

12. The levers R′ R′, operating and arranged in the manner and for the purpose substantially as set forth.

13. Rolling the cigarette by the combined action of rollers *v w v′ w′* and a lever, N, as described.

14. Holding firmly the paper while being cut by the action of the knife L by means of the feeding-rollers G G′, and by the forming-lever N, while the latter is acting upon the tobacco and distributing the same evenly on the paper.

15. The combination of the feeding-rollers G G′, the bar K, and knife L, the forming-rollers *v w v′ w′*, the forming-bar N, the lever T, the levers Q Q, and the levers R′ R′, when arranged, combined, and working together in the manner and for the purpose substantially as set forth and described.

16. The construction of the wheels H, W′, E, and W, attached to the driving-shaft and operating the different parts of the machine, in the manner and purpose as set forth.

MANUEL J. LOPEZ Y MUÑOZ.

Witnesses:
HENRY E. ROEDER,
WM. REICHMANN.