5 Sheets—Sheet 1.

# J. S. WINSOR.

## CIGAR-MACHINE.

No. 188,559. Patented March 20, 1877.

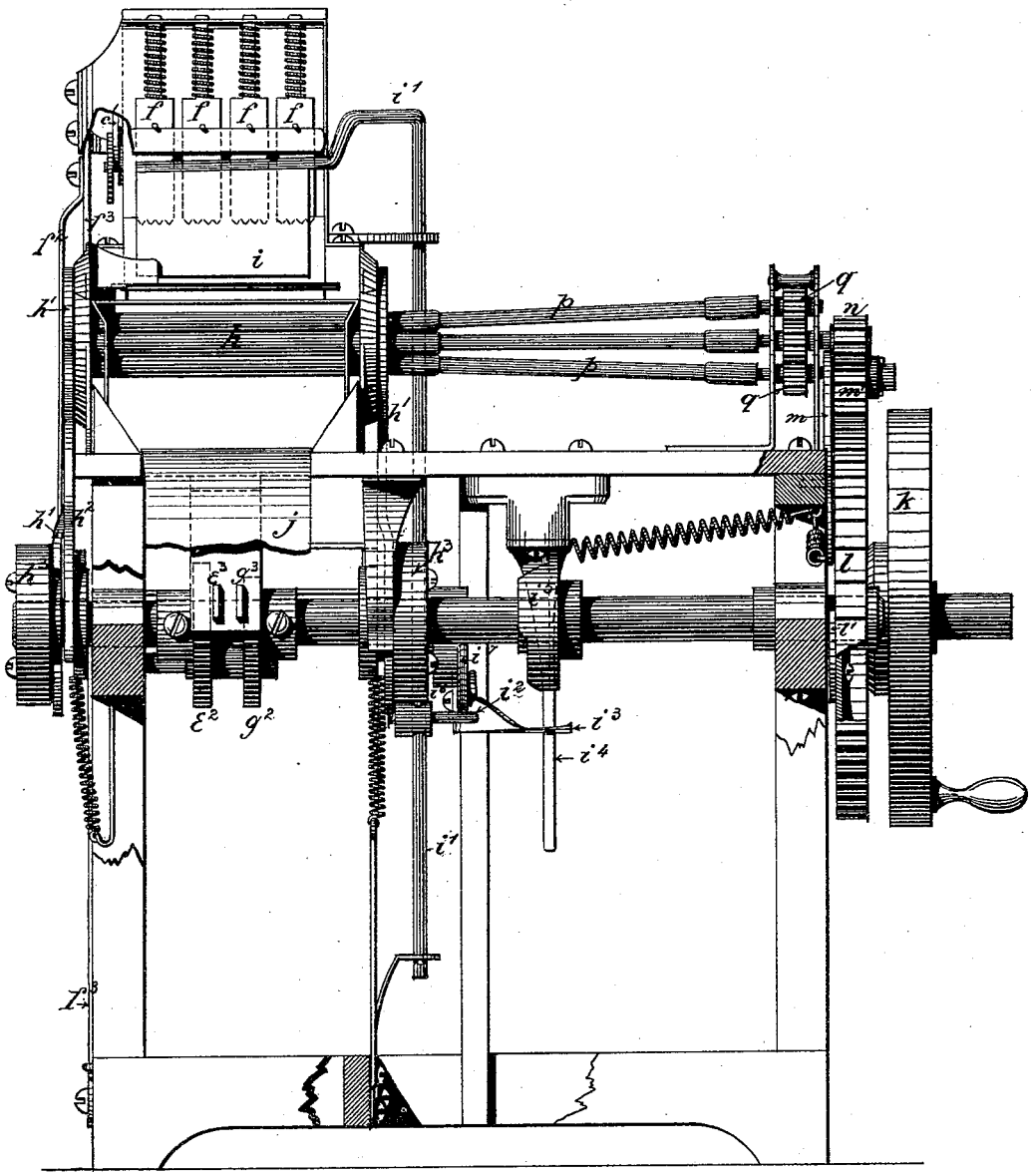

FIG. 1.

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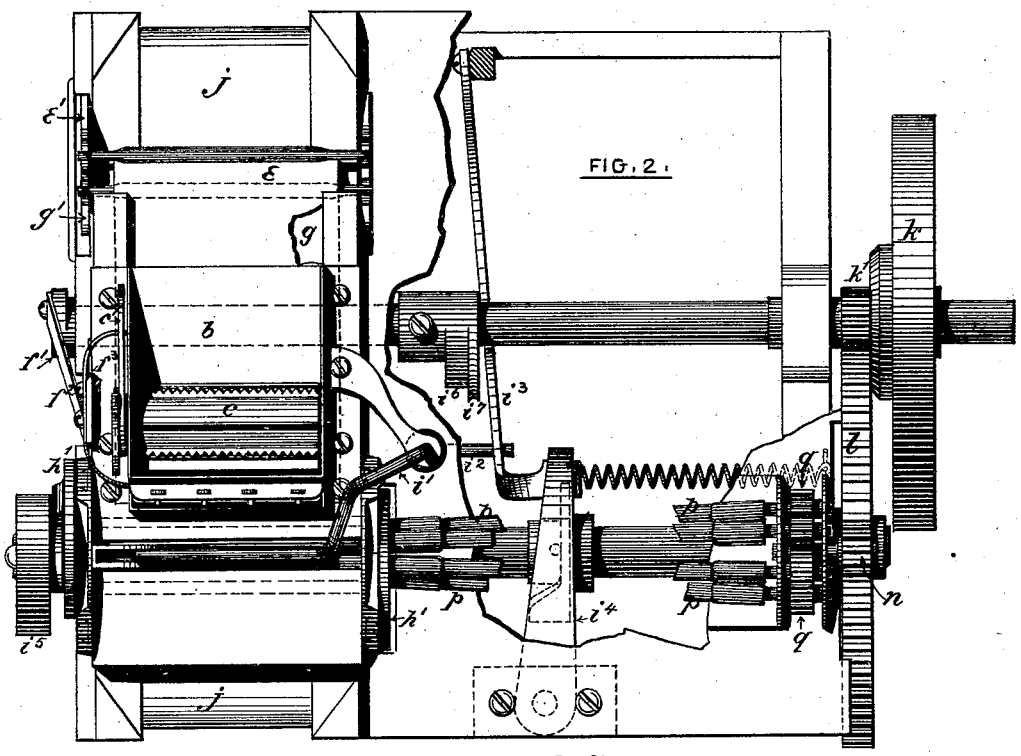

FIG. 2.

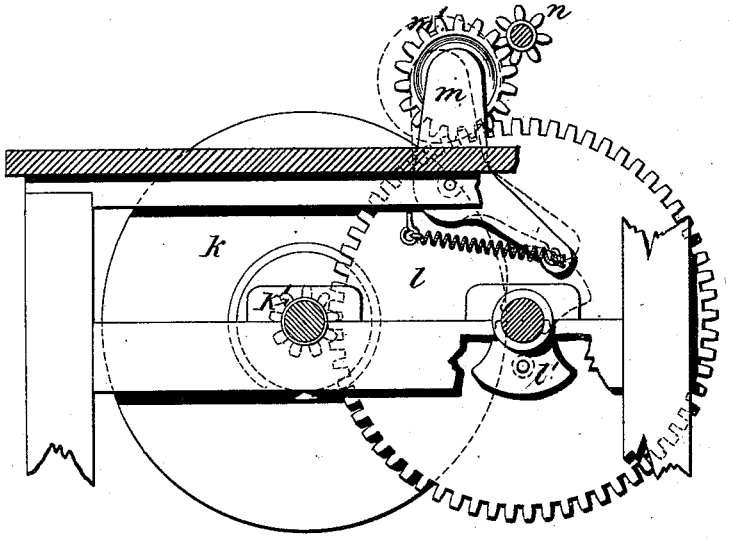

FIG. 6.

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## CIGAR-MACHINE.

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FIG. 4.

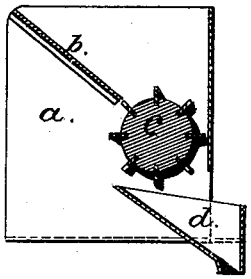


FIG. 5.

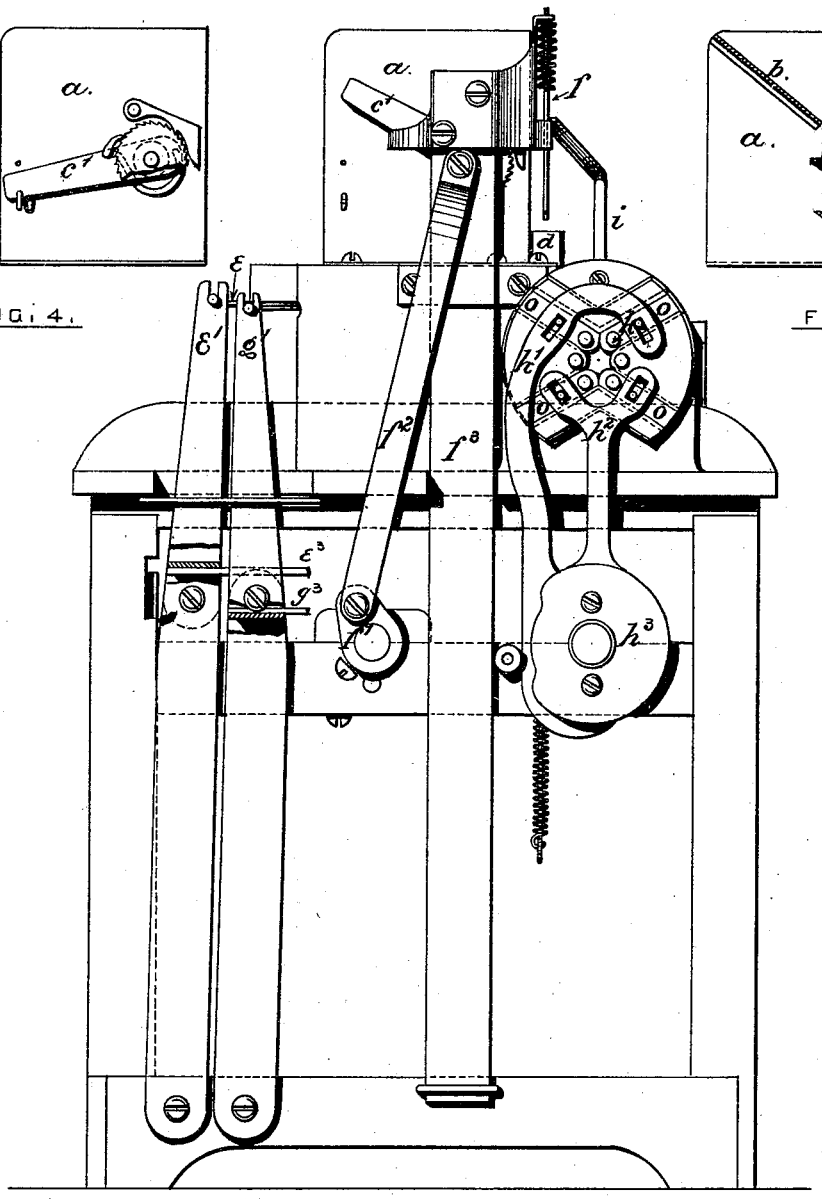


FIG. 3.

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## CIGAR-MACHINE.

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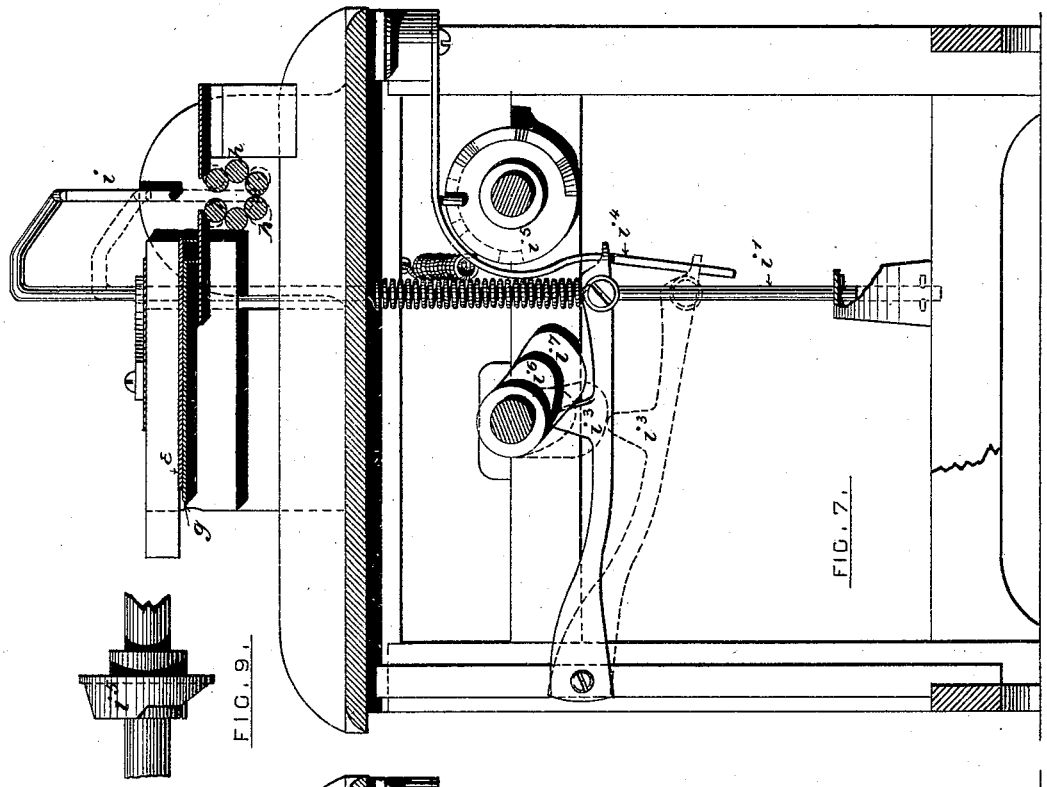

FIG. 7.

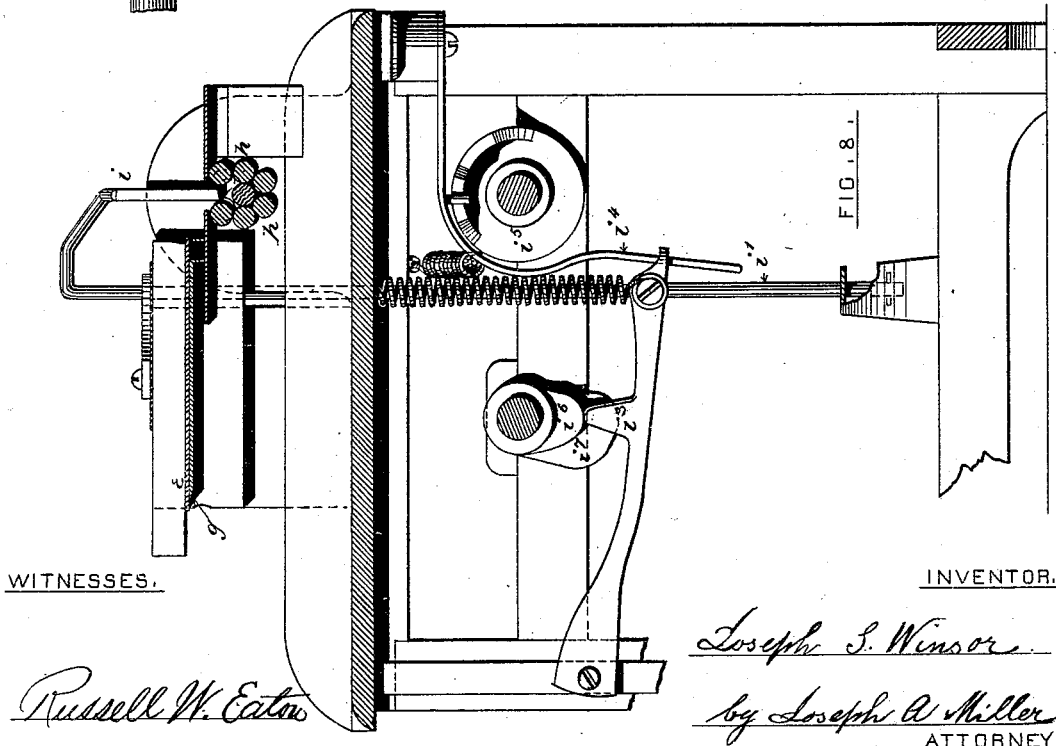

FIG. 8.



FIG. 9.

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## CIGAR-MACHINE.

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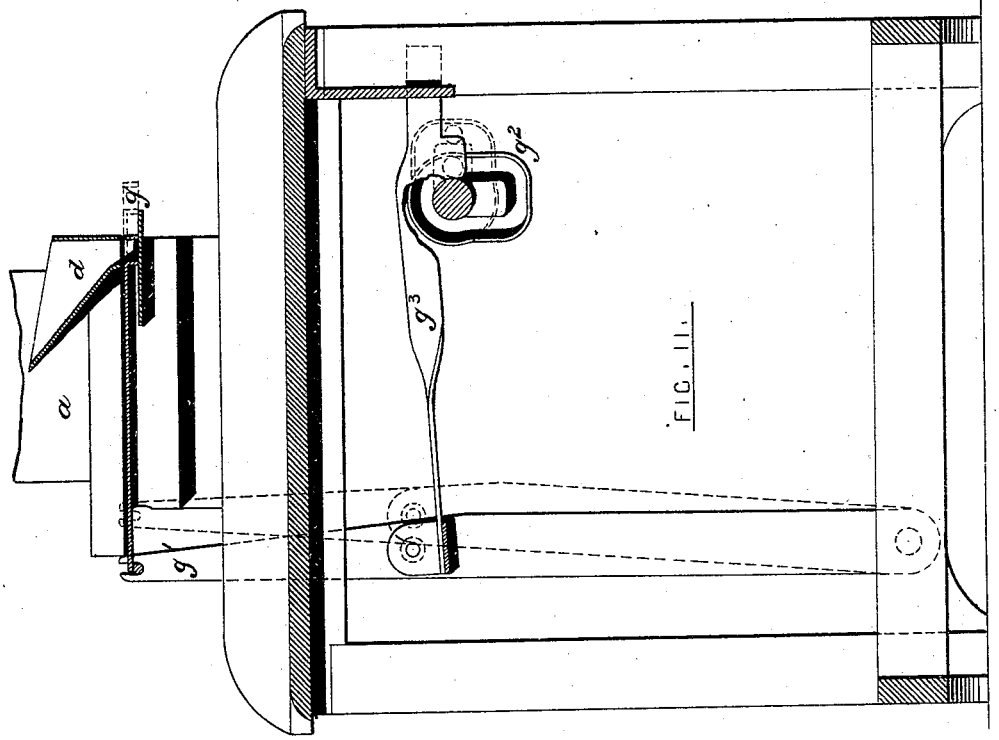


FIG. II.

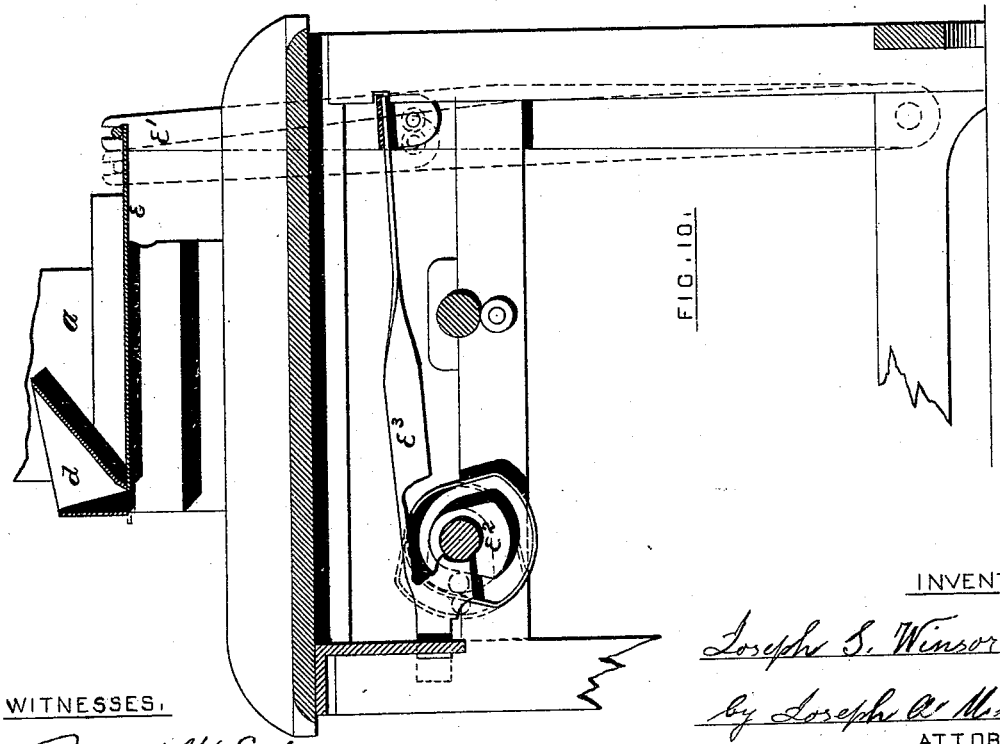


FIG. 10.

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# UNITED STATES PATENT OFFICE.

JOSEPH S. WINSOR, OF PROVIDENCE, ASSIGNOR TO MYRON FISH, OF VALLEY FALLS, RHODE ISLAND.

## IMPROVEMENT IN CIGAR-MACHINES.

Specification forming part of Letters Patent No. **188,559**, dated March 20, 1877; application filed November 6, 1876.

*To all whom it may concern:*

Be it known that I, JOSEPH S. WINSOR, of the city of Providence, county of Providence, and State of Rhode Island, have invented certain new and useful Improvements in Machinery for Making Cigars; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The object of this invention is to so arrange a machine for making cigars that the same may be driven by power at a high speed; that any desired quantity of filling-tobacco may be delivered automatically to the rolling device, and there deposited, and in which the binder or wrapper may be fed and automatically rolled around the filling, the rolled cigars discharged, and all the motions necessary to form and deliver the cigars be performed automatically and successively.

In the drawings, Figure 1 is a front elevation of my machine. Parts of the frame are shown as broken away so as to show the mechanism more clearly. Fig. 2 is a top view of the machine with parts of the table and also parts of the upper mechanism shown as cut away, so as to show more clearly the mechanism beneath the same. Fig. 3 is a side elevation of the machine, shown at the moment when the cigar is discharged from the rolls, all the parts being shown in the position occupied at that moment. Fig. 4 is an end view of the hopper, showing the lever and pawl by which intermittent rotary motion is imparted to the feeding-roll. Fig. 5 is a sectional view of the hopper, showing the feeding-roll. Fig. 6 is a view of the main driving mechanism, showing the means employed to impart intermittent rotary motion to the rolls. Fig. 7 is a sectional view of my machine, showing the position of the cam and lever by which the follower is operated—in solid lines in one position, and in broken lines in another position. Fig. 8 is also a sectional view, showing the cam and lever in position when the follower has delivered a charge to the rolls. Fig. 9 is a view of the cam by which horizontal motion is imparted to the lever which operates the follower. Fig. 10 is a sectional view, showing the mechanism for operating the knife-plate; and Fig. 11 is a sectional view, showing the cam and lever for operating the reciprocating carrier-box.

Similar letters of reference indicate corresponding parts in all the figures.

In the drawings, *a* is the hopper provided with the inclined shelf *b*. *c* is the feed-roll, provided with a number of longitudinal knives or projecting plates, the edges of one-half of which are serrated and the other half straight. The feed-roller *c* delivers the tobacco from the hopper *a* to the smaller hopper *d*.

The serrated teeth serve to draw the binders from the hopper-receptacle and force them to the smaller hopper *d*, while the filling-tobacco is deposited in the receptacles formed between the plate, and is likewise carried around the roller and deposited in the small hopper *d*.

Alternate or intermittent motion is imparted to the feed-roller *c* by means of the lever pawl and ratchet shown in Fig. 4.

The knife E, reciprocated by means of the lever E′, closes the lower aperture of the hopper *d*, and the vertically-reciprocating spring-pressed compressors *f* compress and consolidate the tobacco in the hopper *d*. As soon as the reciprocating carrier-box *g* has arrived under the hopper *d* the knife-plate *e* is withdrawn, and the compressors *f f* force the tobacco into the carrier *g*, which, being operated by the lever *g′*, is carried forward and directly over the rollers *h h*. The two upper rollers, at this time, are sufficiently apart to admit the tobacco between them, the lower rollers being close together to retain the same.

The follower *i* now passes downward through the carrier-box *g*, and delivers the tobacco between the six rollers *h h*, and as soon as it is withdrawn the two upper rollers are placed together and all the rollers rotate, and so roll the tobacco into a roll, the binder or wrapper

being inserted between the rolls, one edge of which being gummed, and is wound round the roll of tobacco, and so binds the roll of tobacco into a cylinder, which forms the interior of the cigar, and only requires the outside wrapper to complete the same.

As soon as the cylinder is finished both the upper and lower pair of rollers separate, and the follower *i* pushes the cylinder out onto the endless apron *j*, by which it is delivered to a suitable receptacle.

The same operation is continued as long as tobacco is supplied and the machine is kept in motion. All the operations are performed automatically, at the precise moment required, by simple mechanical means.

Motion is imparted to the machine by means of a belt passing over the pulley *k*, and to the same shaft the pinion *k'* is secured. This pinion gears into the larger gear *l*, to the shaft of which the cam *l'* is secured, which, during a certain part of its rotation, comes in contact with the bell-crank *m*, to the upper end of which the gear *m'* is secured, so that when the cam *l'* comes in contact with the arm *m*, the gear *m'*, which, ordinarily, rotates the pinion *n*, becomes disengaged from the same, so that an intermittent rotary motion is imparted to the pinion *n*, as will be clearly seen in Fig. 6.

The main driving-shaft and the shaft of the large gear-wheel *l* extend across the whole width of the machine, and from these shafts nearly all the motions are communicated to the several parts by means of cams and cranks.

The six rollers *h h* are supported in bearings, the two central having adjustable but fixed bearings, and the upper and lower pairs of rollers have adjustable sliding bearings in the radial slides *o o*, which are operated by cams and slotted levers, so that at the proper time the upper rolls are separated to receive the charge of tobacco, and again close, while, at another time, both the upper and lower set of rollers are moved apart to allow of the roll of tobacco being discharged. To allow such freedom to the rollers, and also drive the same at exactly the same speed, I provide one end of the rollers with a square or other suitable projection, which may enter a coupling-sleeve on the connecting-rods *p p*, the other ends of the rods *p p* being also provided with sleeves, by which they are connected with the gears *q q*, and these gears are arranged around a gear placed on the same shaft with the gear *n*, so that when the gear *n* engages with the gear *m'*, the six gears *q q* turn as they are arranged around the central gear, driven by the pinion *n*, and all have the same speed.

The rotation of the rolls *h* is stopped when the charge of tobacco is being placed between the rolls, and also when the rolled tobacco is discharged, and to regulate this at the proper time the cam *l'* is arranged to come in contact with and lift the lower end of the hinged arm *m*, and so disengage the gear *m'* from the pinion *n*, as is shown in broken lines in Fig. 6.

The follower *i* performs two important offices. The first is to deliver the charge of tobacco between the rolls at the precise moment when the carrier *g* is over the center of the rollers and the two upper rollers have been moved apart; and the second, when the tobacco has been sufficiently rolled and the binder secured to pass between the rollers and deposit the rolled cylinder onto the endless apron *j*, which passes under the rollers, and this second movement must be made at the time and within the time the rollers are open to allow the follower to pass through.

Figs. 7 and 8 clearly show the positions of the follower. Fig. 7 shows the follower in solid lines at rest, and in broken lines when it passes through the rollers and delivers the cigar, and Fig. 8 shows the position of the follower when it has just placed the tobacco between the rolls.

The lever $i^3$ is shown as occupying these different positions, and its relation to the cam $i^6$ and $i^7$ is clearly shown.

The vertical rod $i^1$, to which the follower *i* is secured, is provided with a long pin, $i^2$, on which the lever $i^3$ is arranged to slide, and the bent end of the lever $i^3$ is provided with a hole, through which the end of the bent lever $i^4$ passes, the upper part being provided with a pin which slides on the cam $i^5$, and this cam $i^5$ (shown enlarged in Fig. 9) imparts such motion to the lever $i^3$ that at the proper time the lever is allowed to pass by the cam, or engages with the cam $i^6$ or the cam $i^7$, according to the motion of the follower at that moment required.

All the levers operated by cams are held against the cams by means of coiled springs or their equivalent, so as to follow the configuration of the cams.

The reciprocating knife-plate *e* is operated through the lever $e^1$ and lever $e^3$ by means of the cam $e^2$, as is shown in Fig. 10, and the reciprocating box-carrier is operated through the lever $g^1$ and lever $g^3$, by means of the lever-cam $g^2$, as is shown in Fig. 11.

The opening and closing of the rolls *h h* at the proper time is effected by means of the slotted levers $h^1$ $h^1$ and $h^2$ $h^2$, operated by the compound cams $h^3$ $h^3$, as shown in Figs. 1 and 3.

The spring-pressed compressors *f f* consist of thin metal plates, their lower edges being serrated and the teeth beveled at the rear. They are so placed as to reciprocate vertically in the small hopper *d*, near the edge of the larger hopper *a*, and their action on the tobacco is to turn the same and partially form a cylindrical-shaped mass by pressing always on one side of the small hopper, which side is purposely rounded, so as to facilitate this consolidating and rolling action.

The compressors *f f* are operated by means

of the crank $f^1$, secured to the main driving-shaft, and from which the connecting-rod $f^2$ extends to the vertical slide $f^3$. From an arm secured to its upper end the compressors are lifted and forced down by the springs secured to the same. The same arm also comes in contact with the pawl-lever $c'$, and imparts partial rotation to the feed-roll $c$.

In front of the machine, at a convenient height, is placed a table, on which the binders are placed. The operative places one of the binders over the center of the rolls $h$ $h$ while the cigar is being rolled, to be used for the next cigar, and when the cigar is discharged, and the lower rolls have opened, the binder is carried down by the follower, and, the lower rolls closing, is ready to receive the charge for the next cigar.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the hopper $a$ and inclined shelf $b$, of the feed-roll $c$, provided with longitudinal knives or serrated plates, and a receptacle to receive the tobacco from the feed-roll, substantially as and for the purpose set forth.

2. The combination, with the hopper $a$ and feed-roll $c$, provided with plates for carrying the binders and filling to hopper $d$, of means, substantially as described, for imparting an intermittent motion to the feed-roll, and a hopper, $d$, to receive the tobacco from the feed-roll, substantially as and for the purpose set forth.

3. The combination, with the hopper $d$ of a cigar-machine, of two or more thin-metal compressors, formed with serrated or toothed ends, substantially as and for the purpose set forth.

4. The combination, with the hopper $d$ of a cigar-machine, of two or more independent yielding compressors, $f$, substantially as and for the purpose set forth.

5. The combination, with hopper $d$, the reciprocating slide $f^3$, and compressors $f$, two or more attached thereto, of the crank $f^1$ and connecting-rod $f^2$, substantially as and for the purpose set forth.

6. The combination, with the roll $c$, reciprocating slide $f^3$, crank $f^1$, and connecting-rod $f^2$, of the ratchet-pawl $c'$, substantially as and for the purpose set forth.

7. The combination, with the compressors $f$ $f$ and hopper $d$, of the reciprocating knife-plate $e$, arranged to close the aperture to hopper $d$, substantially as and for the purpose set forth.

8. The combination, with the hopper and compressing-rollers of a cigar-machine, of compressors $f$, a reciprocating carrier, and means for actuating the carrier, substantially as described, whereby the carrier delivers the tobacco from the hopper to the rolls, substantially as and for the purpose set forth.

9. The combination, with the knife-plate $e$ and levers $e^1$ $e^3$ and cam $e^2$, for operating the same, of the hopper $d$, compressors $f$, and carrier-box $g$, levers $g^1$ $g^2$ and cam $g^3$, substantially as and for the purpose set forth.

10. The combination, with the hopper $d$ and compressing-rolls of a cigar-machine, of a reciprocating carrier and the follower $i$, operating substantially as and for the purpose set forth.

11. The combination, with the compressing-rolls of a cigar-machine, the upper and lower sets of which are adapted to be opened and closed, and suitable means for alternately opening and closing said rolls, of a follower, arranged to have an intermittent movement and pass through the opening between the rolls to deposit and discharge the tobacco, substantially as and for the purpose set forth.

12. The combination, with the rolls and carrier of a cigar-machine, the upper and lower pairs of said rolls adapted to be opened and closed, of a follower, $i$, rod $i^1$, lever $i^3$, cams $i^5$ $i^6$ $i^7$, and shifting-lever $i^4$, substantially as and for the purpose set forth.

13. The combination, with the rolls of a cigar-machine, the upper and lower pairs of said rolls journaled in movable bearings arranged in lines radiating from a common center, of cams and connecting-rods, arranged substantially as described, whereby the upper and lower rolls are alternately forced apart to admit the tobacco and discharge it therefrom, substantially as and for the purpose set forth.

14. The combination, with the follower of a cigar-machine, and suitable means to impart intermittent movement thereto to deposit and discharge the tobacco, of a set of rolls, the upper and lower pairs of which are journaled in movable bearings, and suitable actuating mechanism, substantially as set forth, whereby the upper and lower pairs of rolls are alternately opened and closed, substantially as and for the purpose set forth.

15. The combination, with the rolls $h$ and radial slides $o$, of the cams and connecting-lever, arranged substantially as set forth, to impart lateral movement to said rolls, substantially as and for the purpose set forth.

16. The combination, with the rolls $h$ $h$, journaled in radial slides $o$ $o$, of the slotted levers $h^1$ and $h^2$ and compound cams $h^3$, substantially as and for the purpose set forth.

17. The combination, with rolls $h$ $h$, journaled in radial slides $o$, and means, substantially as described, for imparting lateral movement to said rolls, of the gears $q$ $q$ and connecting-rods $p$ $p$, the latter adapted to have lateral movement to correspond with the movement of the rolls, substantially as and for the purpose set forth.

18. The combination, with the gear $l$, of the cam $l'$, hinged bell-crank lever $m$, and gear $m'$ and pinion $n$, substantially as and for the purpose set forth.

19. The combination, with the rolls $h$, of

the driving-gears, one of said gears pivoted to a rocking lever, and a cam secured to the main gear, whereby the rolls are automatically stopped to receive the charge, substantially as and for the purpose set forth.

20. The combination of main driving-shaft, compressors, feeding-rolls, and means substantially as set forth, to actuate the same, of the counter-shaft, laterally-moving rolls, follower, knife-plate, carrier, and means substantially as set forth, for actuating the same, substantially as and for the purpose set forth.

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AMOS A. WHITE.