(No Model.) 2 Sheets—Sheet 1.

S. ABOJADOR.

MACHINE FOR PREPARING OR REDUCING AND COMMINUTING TOBACCO FOR CIGARETTES.

No. 485,483. Patented Nov. 1, 1892.

FIG. 1.

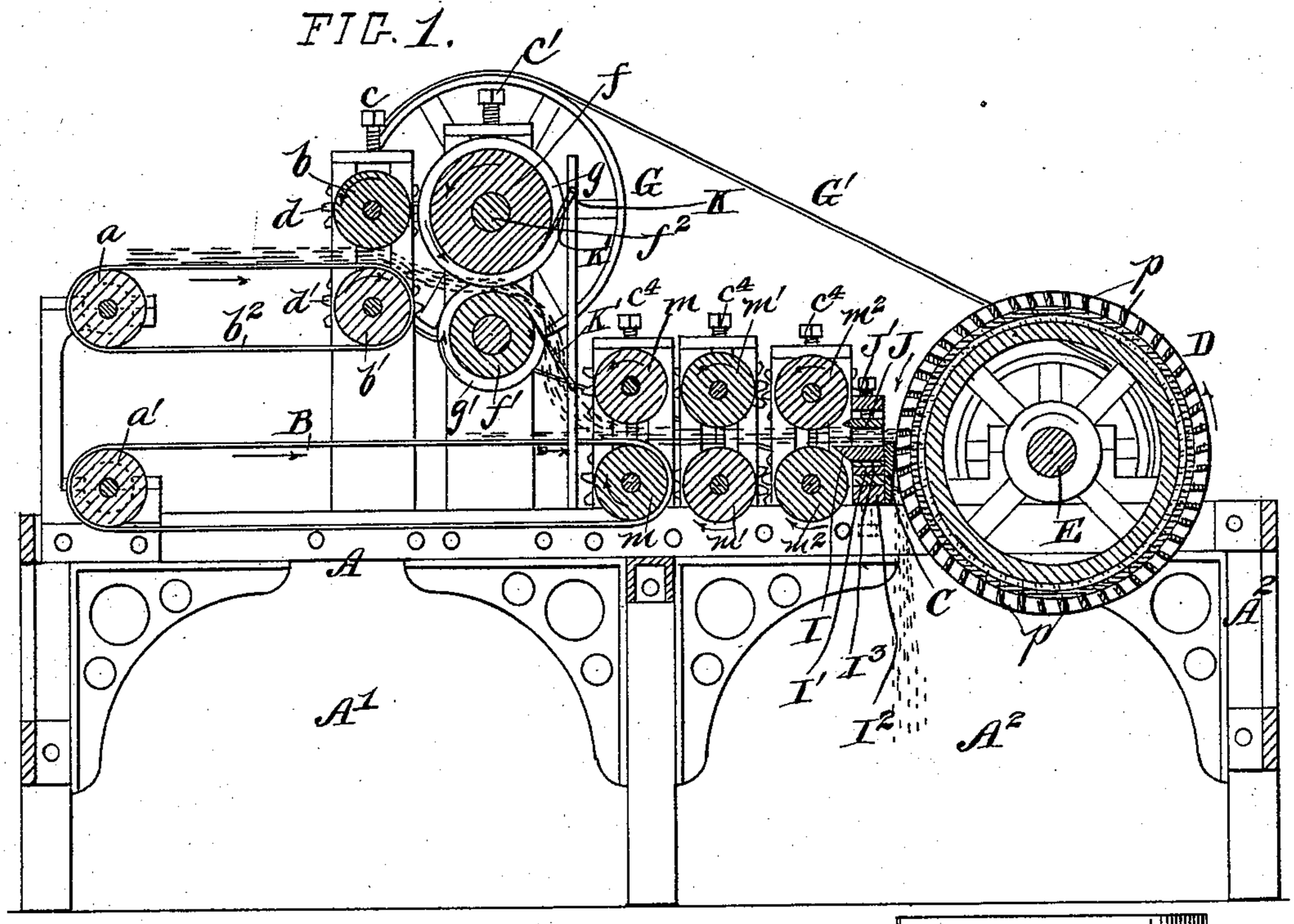
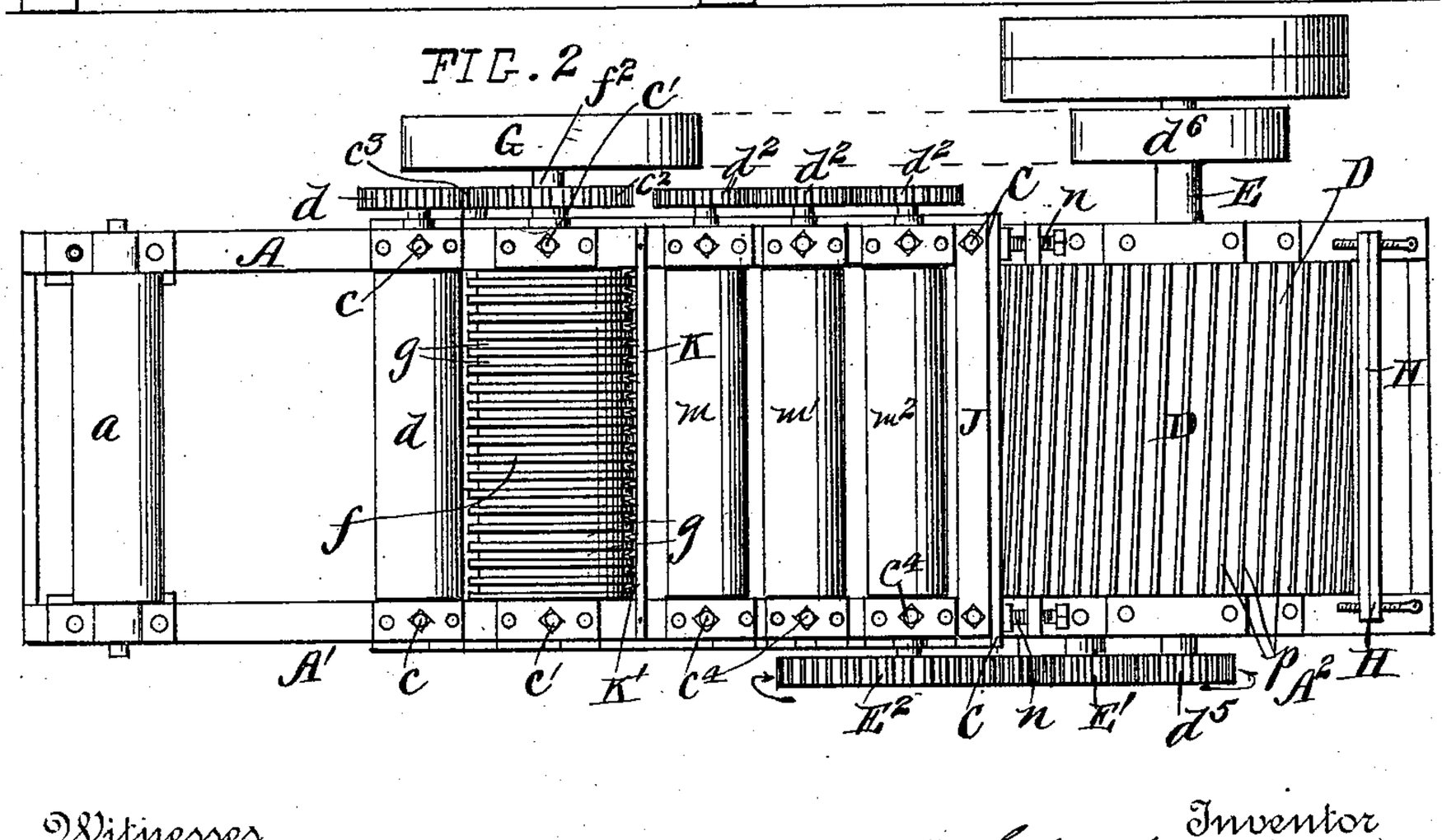


FIG. 2.



Witnesses
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C. Hines.

Inventor
Sebastian Abojador
By his Attorneys: Marks, Lemmick & Lawrence

(No Model.) 2 Sheets—Sheet 2.

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FIG. 6

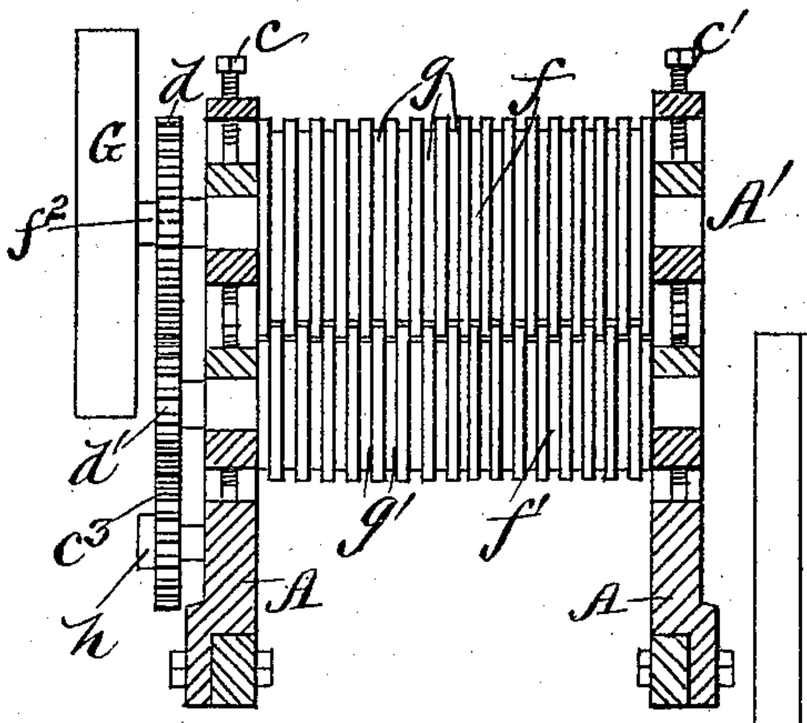


FIG. 5.

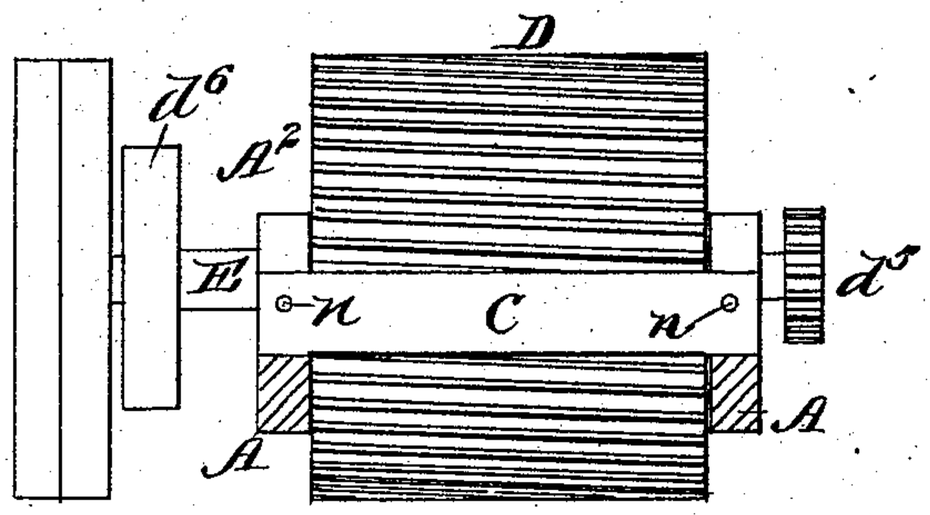


FIG. 3.

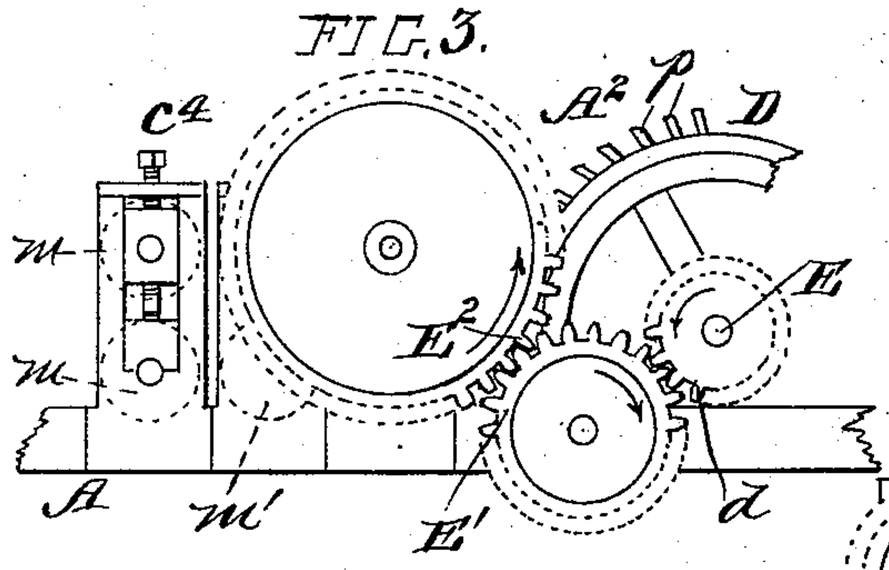


FIG. 7

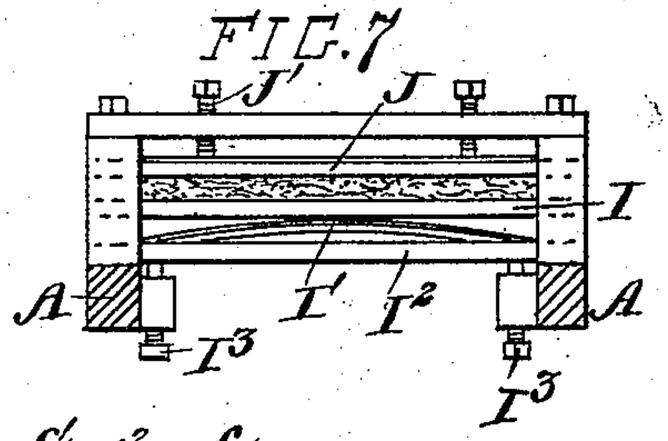
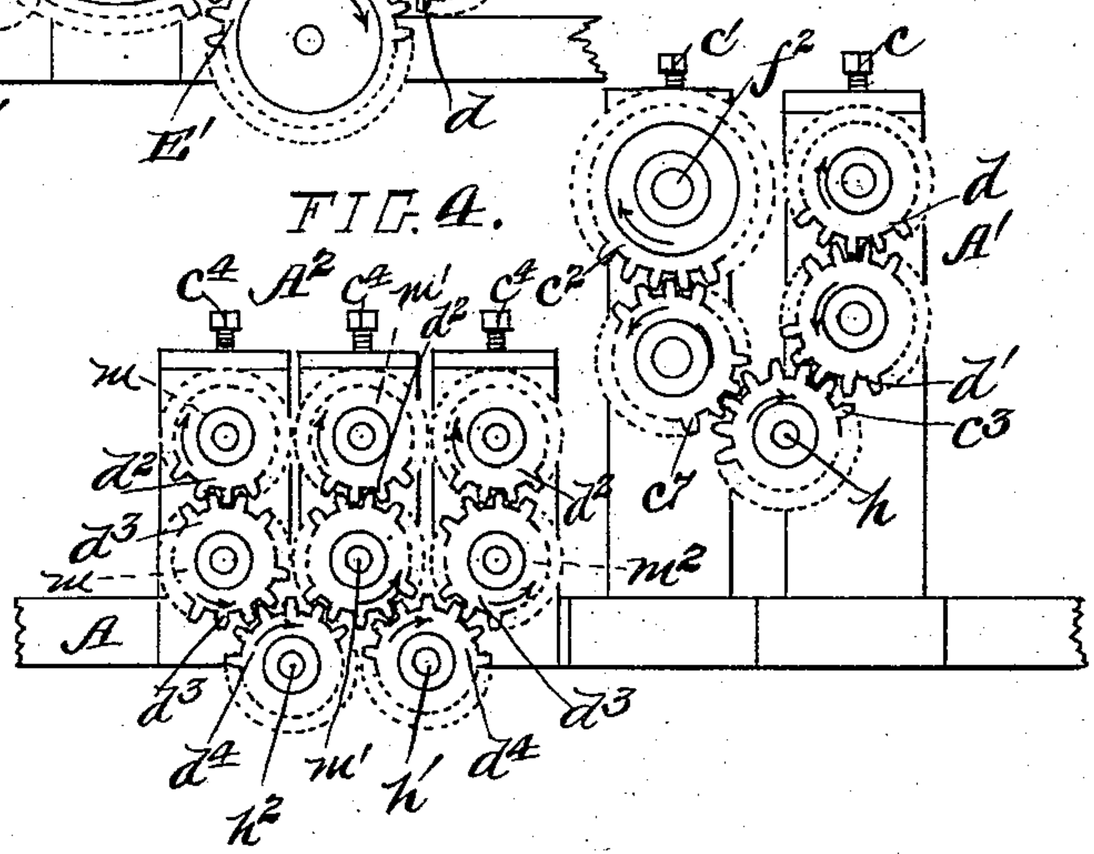


FIG. 4.



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UNITED STATES PATENT OFFICE.

SEBASTIAN ABOJADOR, OF MADRID, SPAIN.

MACHINE FOR PREPARING OR REDUCING AND COMMINUTING TOBACCO FOR CIGARETTES.

SPECIFICATION forming part of Letters Patent No. 485,483, dated November 1, 1892.

Application filed June 16, 1892. Serial No. 436,916. (No model.)

To all whom it may concern:

Be it known that I, SEBASTIAN ABOJADOR, a subject of the King of Spain, residing at Madrid, in the Kingdom of Spain, have invented certain new and useful Improvements in Machines for Preparing or Reducing and Comminuting Tobacco for Cigarettes and other Analogous Uses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for preparing or reducing and comminuting tobacco used in the manufacture of cigarettes and for other analogous purposes; and its object is to provide a machine which will first press or squeeze and so operate upon the tobacco-stock as to divide it into narrow longitudinal strips, thereby rendering it free from rigid leaf-stalks and filaments and bringing it to a condition for more ready further reduction; second, to cut the thus-prepared tobacco-stalk very rapidly and to the necessary degree of fineness for making cigarettes, the organization of the compound machine being such that the product thereof does not appear broken, uneven, or rough, there remaining no waste, no solid stalks, nor vein-like filaments of the leaves of tobacco, nor dust-like particles, nearly every portion of the tobacco-stock being reduced and cut with great uniformity, exactness, and perfection with economy of labor and stock, and as the stalk and vein-like filaments are reduced and softened along with the blade of the leaf and then cut to a fineness suitable for manufacture of cigarettes the stalks and filaments are utilized in the manufacture of cigarettes without prejudice to the good flavor of the tobacco of the blade of the leaf, and this without being noticed in the manufactured cigarettes. Besides this the stalks and solid filaments, without the aid of the flavor of the conjoined particles of the leaf when treated and cut up separately from the blade of the leaf with my machine can be used without injury to the flavor of better qualities of tobacco-stock for the manufacture of the cheaper grade of cigarettes.

My invention consists of a machine comprising a novel construction, combination, and arrangement of grooved cutting, squeezing, and reducing cylinders, plain squeezing-cylinders, feeding or conveying aprons, a comb, a stationary cutting-blade, and a cylinder furnished with spiral blades, all as will be hereinafter described, and pointed out in the claims.

My invention also consists in certain other novel combinations of parts in the said machine, as will appear from the following specification and the accompanying drawings, in which latter—

Figure 1 is a central longitudinal section of my improved machine for operating upon tobacco and bringing it into a condition for use in manufacturing cigarettes. Fig. 2 is a plan view of the machine, the conveyer-aprons being left off. Fig. 3 is a broken side elevation of one side of the machine, and Fig. 4 is a broken side elevation of the machine as seen on the opposite side to that shown in Fig. 3. Fig 5 is a cross-section of the machine on a line back of the stationary cutting-blade and forward of the cylinder of spiral blades. Fig. 6 is a cross-section in a line forward of the first pair of cylinders and in rear of the grooved cylinders; and Fig. 7 is a cross-section on the same line as Fig. 6 is taken, but looking in an opposite direction and showing the pressure-bars.

A in the drawings designates a frame comprising bearings or supports for the two sections $A' A^2$ of my machine, which may be designated as a "compound" machine, as the section A' performs the preparatory treatment of the tobacco and the section A^2 the finishing and cutting of the same to the required fineness for use in manufacturing cigarettes. The section A' has rollers a a' mounted in standards at its front end, one above the other and a considerable distance apart. These rollers have different offices and will be hereinafter described. Forward of the rollers a a' a pair of cylinders b b' are mounted in bifurcated standards. The upper cylinder is arranged to bear with considerable pressure by its weight upon tobacco passed between it and the cylinder b', and this pressure is regulated by screws c c. Around the roller b' and the roller a an endless feed or conveyer apron b^2 of a width equal to the length of the cylinders is arranged to revolve. On the ends of the

shafts of the cylinders *b* and *b'* spur gear-wheels *d d'* are applied for the purpose of revolving the cylinders positively in the direction of the arrows. Forward of the cylinders just mentioned a pair of concentrically-grooved cylinders *f f'* are mounted in bifurcated standards, and the upper cylinder of this pair is allowed to exert considerable pressure by its weight, and this pressure may be regulated by screws *c' c'* in the same manner and for the same purpose as the first pair of cylinders. The surfaces of these cylinders have concentric grooves *g* cut in them to a suitable depth and at short distances apart, said grooves extending all around the cylinders, they being begun at or near one of the ends of the cylinders and terminated at or near the other ends. The grooves occupy the entire surfaces of the cylinders less the width of the ridges formed between them, as shown. The upper cylinder *f* is larger than the lower one *f'*, and its grooves should be slightly deeper than those of said lower cylinder. The ridges between the grooves are formed with sharp slitting edges or corners, and as the ridges of the respective cylinders enter the grooves of the respective cylinders the tobacco is cut by these corner edges into narrow strips as it passes between the cylinders, and while this is being accomplished the solid stems and the vein-like solid filaments of the blades of the leaves are so crushed or flattened or softened to a pliable condition by the cylinders on opposite sides of the matching ridges and grooves that the tobacco-stock is reduced to a proper state for being further treated and finally cut to that degree of fineness which is required for the manufacture of cigarettes. On the shafts of the cylinders *f f'* spur-gears c^2 c^7 are provided, and the same gear with one another; and between the first and second pair of cylinders an intermediate pinion-wheel c^3 is placed on a short arbor *h*, so as to gear with the lower wheels *d' c*^{7} of the first and second pairs of cylinders, and thus insure the revolution of the upper cylinder of the first pair in the same direction as the upper cylinder of the second pair. The shaft f^2 of the upper grooved roller is extended, and on this extension a driving-pulley G is applied for setting the mechanism of the section A' in motion. Forward of the mechanism just described, which mechanism is comprised in section A' of the machine, are arranged three pairs of cylinders *m m' m*^{2} in bifurcated standards. The upper cylinders exert pressure by their weight, and this pressure can be regulated by screws c^4 c^4, and on the shafts of these upper cylinders spur-gears d^2 are provided, through which the upper cylinders of the respective pairs are revolved. The upper cylinders of the three pairs of cylinders are geared with the lower cylinders by spur-gears d^3 of the lower cylinders, and the gears d^3 with intermediate pinions d^4 on short arbors *h' h*^{2}. On the roller *a'* and the lower cylinder *m* an endless revolving tobacco catching and conveying apron B is arranged. This apron is located beneath the first and second pairs of cylinders *b b'* and *f f'* of the section A' of the machine, and is also extended forward far enough to convey the prepared tobacco to the cylinders of the section A^2, thus insuring the catching and saving of all tobacco that falls down from the cylinders, while serving for conveying the whole mass of tobacco to the said section A^2 for the final operation. Forward of the last pair of cylinders, but in close proximity thereto, a stationary bevel-edged cutting-blade C is secured across the machine on strong adjusting-screws *n*. This blade can be moved by the screws so as to regulate the degree of fineness to which the tobacco is finally cut. In conjunction with this blade a large rotating cylinder D, provided with a great number of obliquely-set and spirally-arranged cutting-blades *p* is employed. This cylinder of blades is located forward of the blade C, and as it revolves its blades clip off the tobacco with shearing cuts to a degree of fineness, accordingly as the blade C is set away from or close to the circumference of the cylinder of blades. Forward of the spirally-bladed cylinder a clearing device H may be arranged on the frame for scraping or brushing off any adhering tobacco from the spiral blades. Just forward of the delivery of the pair of rolls *m*^{2} *m*^{2} two bevel-edged pressure-bars I and J are applied. The bar I is mounted on a spring I', which rests on an adjustable support I^2, resting on pressure-screws I^3, and the bar J is forced downward by means of pressure-screws J'. As the tobacco emerges from the rollers *m*^{2} it passes between these bars, and during the cutting operation these bars and the last pair of cylinders exert a very firm pressure and grip upon the tobacco, and thus enable the cutters to act positively or keenly upon it, severing it without bunching, breaking, or roughening it. The power for operating the cylinder of knives may be derived from a small steam or other engine and transmitted through a pulley-shaft E, on which are provided suitable pulleys and a toothed pinion-wheel d^5, which gears into an intermediate toothed wheel E' and a large spur-wheel E^2 of the lower cylinder of the pair *m*^{2} of cylinders next to the cylinder D of blades, as illustrated in the drawings. A belt G' leads from a pulley d^6 on the shaft E to the pulley G on the shaft f^2 of the upper grooved cylinder *f*, and thus sets the gearing of the section A' in motion.

In the construction of a given-sized machine it has been found practicable to use one hundred and twenty-five spirally-arranged knives on a cylinder seventy-five centimeters in diameter, and with such number of knives and proportion of cylinder the speed of the cylinder of the third pair *m*^{2} of pressing-cylinders may be such as to introduce to the bladed cylinder and stationary blade thirty centimeters of tobacco during a single revolution

of the spirally-bladed cylinder. The section A of the machine may be arranged alongside section A′, and the tobacco discharged from section A may be handled and passed between the rollers of section A′; but it is best to have the sections A A′ arranged as shown.

In the construction of the grooved cylinders it is found that it is practicable to so space the grooves and ridges that the tobacco can be cut to two and one-half millimeters in width and then passed to the section A^2 of the machine to be further pressed and squeezed and cut to the proper size for making cigarettes.

With a machine constructed in accordance with my invention and having a spirally-bladed cylinder of the diameter mentioned ten thousand kilograms of tobacco suitable for cigarette manufacture can be cut from sunrise to sunset and double that if run day and night and in the most satisfactory manner and with slight expenditure for power. A toothed plate or comb K is applied forward of the grooved cylinders, so that its teeth K′ enter the grooves of the cylinders and cause all adhering tobacco to be forced out of the grooves and to fall upon the catching and conveyer apron, and thus the grooved cylinders are kept in an operative condition.

What I claim as my invention is—

1. In a machine for preparing and cutting tobacco for cigarettes and the like, the combination of the rear pair of feeding and pressure and squeezing cylinders, the grooved pressure and slitting cylinders, both pairs mounted in standards of a frame, the gears for connecting said pairs of cylinders, means for introducing the tobacco to the cylinders, and means for driving the grooved cylinders directly and setting the other cylinders in motion, a spirally-bladed cylinder, a stationary blade, and one or more intermediate pressing-cylinders, substantially as described.

2. The combination of the rear pair of feeding and pressing and squeezing cylinders, the grooved pressing, squeezing, and slitting cylinders, both mounted in standards of a frame, the gears for connecting said pairs of cylinders, a feed-apron, and an endless catching and conveying apron, a third pair of pressing and squeezing cylinders, a spirally-bladed cylinder, a stationary blade, and means for operating said three pairs of cylinders and the spirally-bladed cylinder and the catching and conveying apron, substantially as described.

3. In a machine for preparing and cutting tobacco for cigarettes, the combination of an upper large grooved cylinder, a smaller lower grooved cylinder, toothed clearing-comb, a rear pair of pressure and squeezing cylinders, gears for connecting the pairs of cylinders, means for operating the cylinders and gears, means for feeding the tobacco to the cylinders, and an apron for catching and conveying the tobacco passed through the pairs of cylinders, substantially as described.

4. In a machine for preparing and cutting tobacco for cigarettes, the combination of the section A′, comprising pressing-cylinders and squeezing and slitting cylinders in pairs, and section A^2, comprising pressing and squeezing cylinders in pairs, a frame for supporting the parts named, a stationary cutting-blade, pressing-bars, and a rotary spirally-bladed cutting-cylinder, an endless catching and conveyer apron, and means for driving the cylinders and apron, all arranged upon said frame, substantially as described.

5. In a machine for cutting tobacco for cigarettes, the combination of the spirally-bladed cylinder, the stationary adjustable blade, driven pressure-cylinders in rear of said blade and cylinder, pressure-bars I J, and means for operating said spirally-bladed cylinder and the pressing and squeezing cylinders, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

SEBASTIAN ABOJADOR.

Witnesses:
JOSEPH A. SPRINGER,
J. D. ALBERTIN.