

No. 638,849.

Patented Dec. 12, 1899.

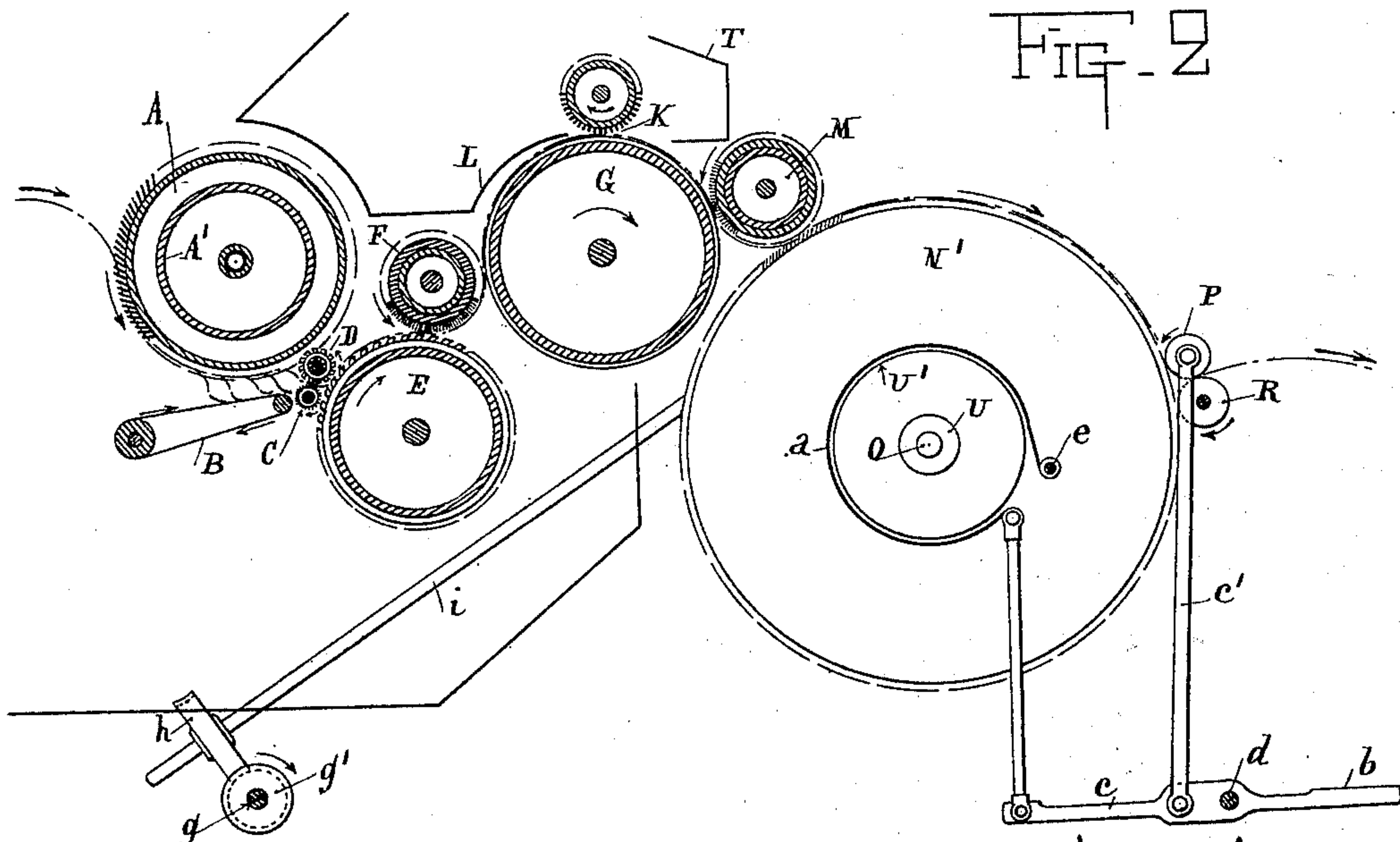
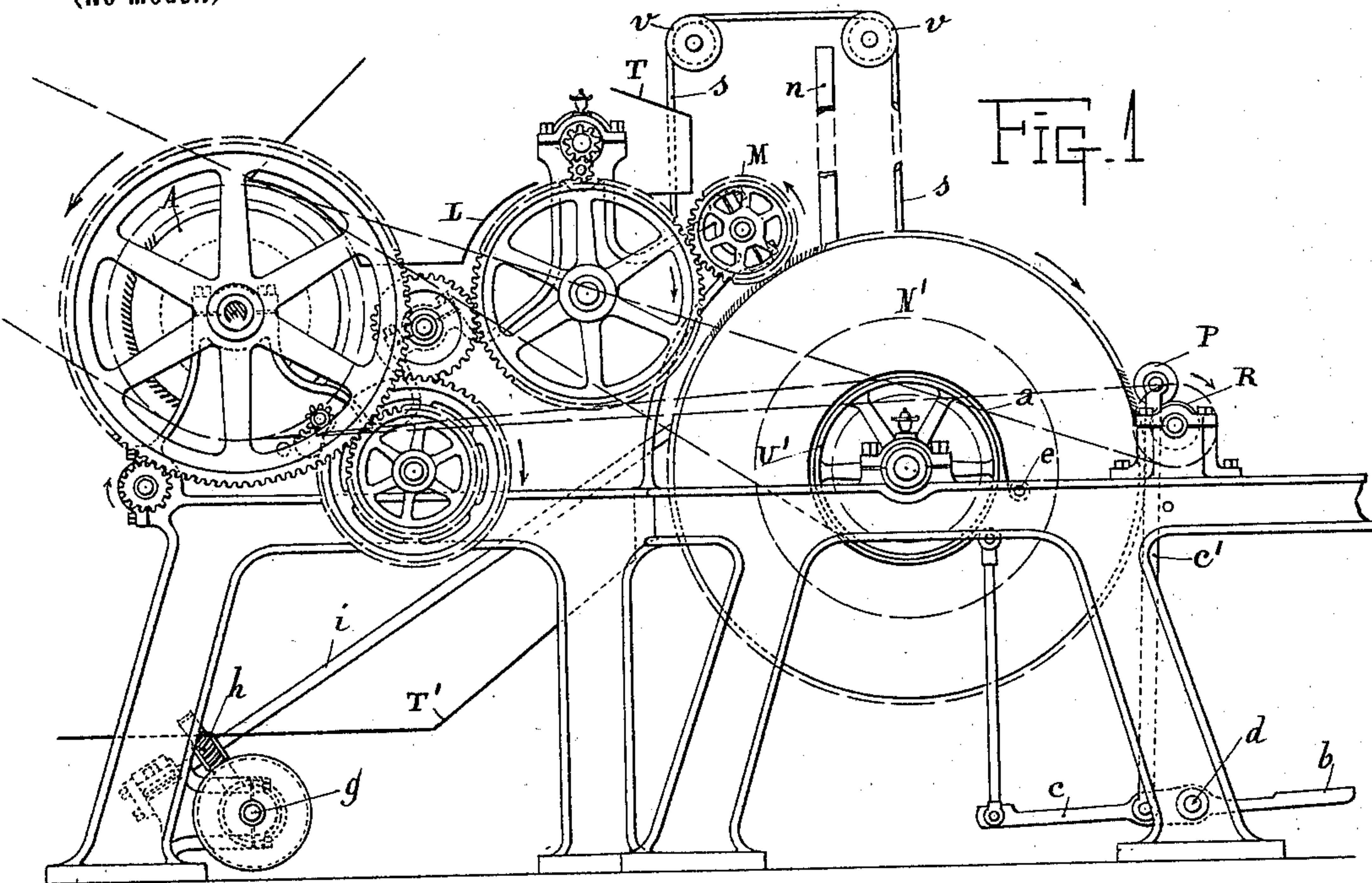
J. D. MOREL.

MACHINE FOR CLEANING RAW FILAMENTOUS SUBSTANCES.

(Application filed Dec. 16, 1897.)

3 Sheets—Sheet 1.

(No Model.)



Witnesses.
J. Chebrek.
A. Hitt.

Inventor
Jules D. Morel,
By H. de Vos.
Attorney.

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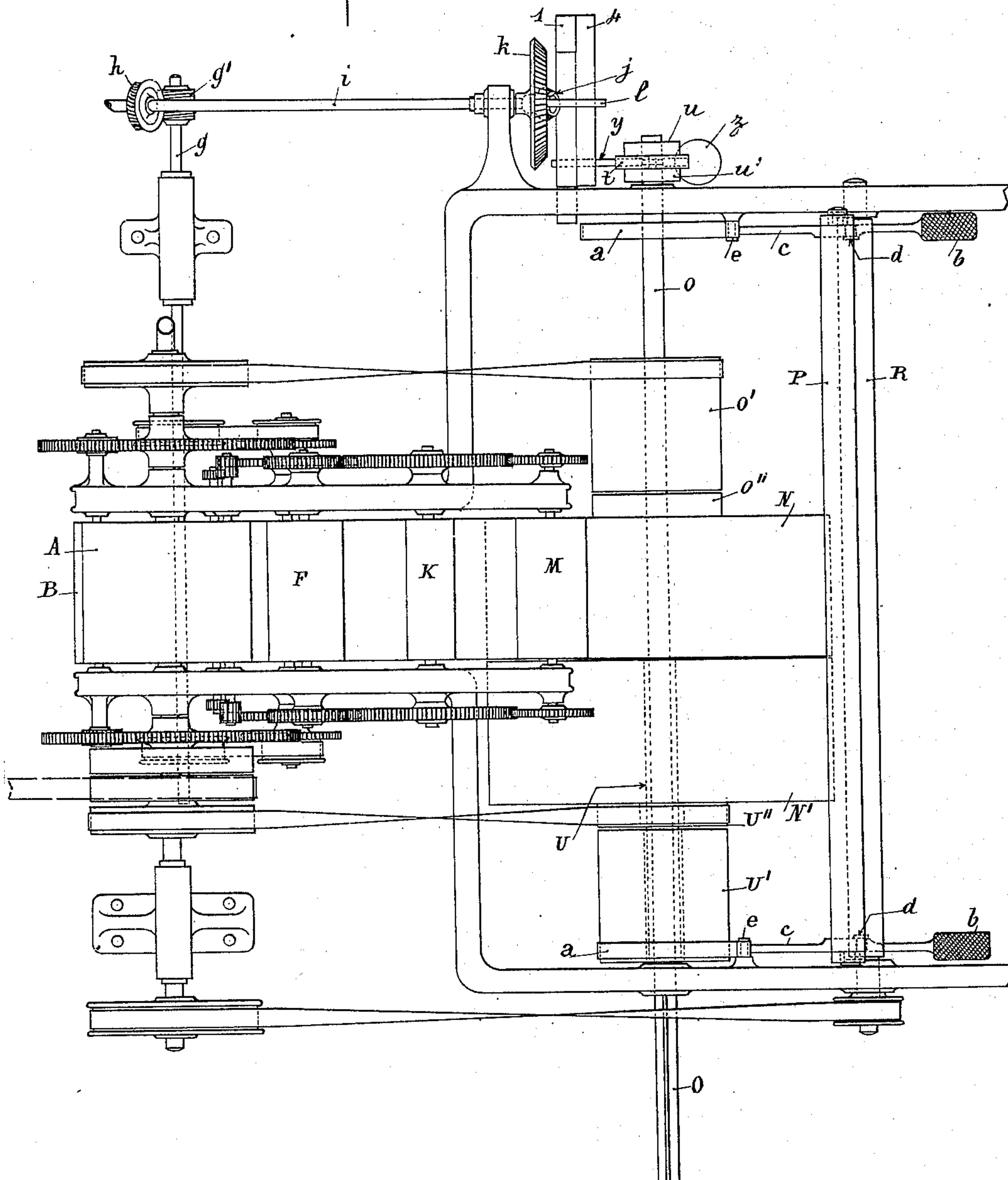
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FIG. 3



Witnesses.
J. L. Chebet.
A. Witt.

Inventor.
Jules D. Morel,
By H. H. de Vos.
Attorney.

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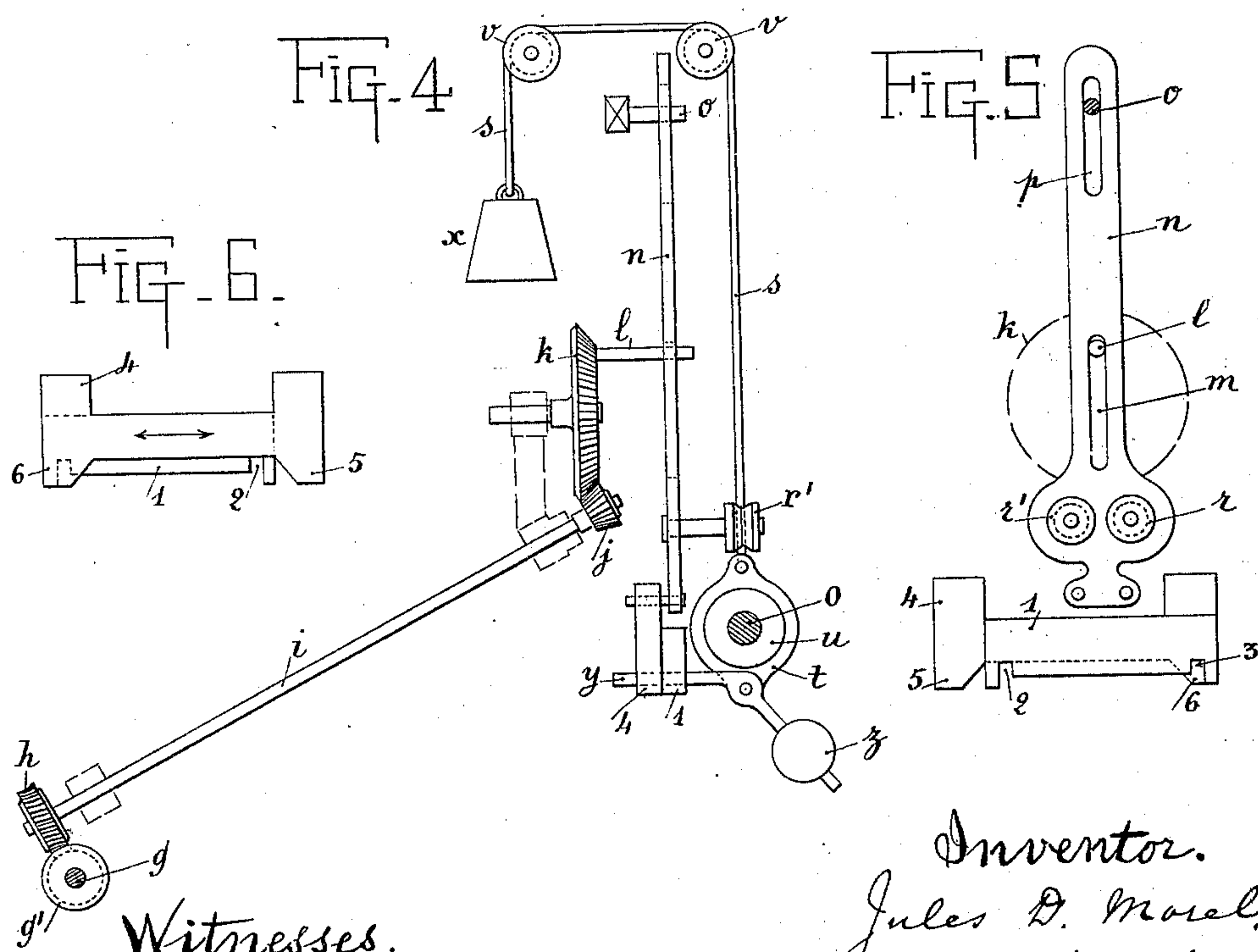
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J. Chebret.
A. Witt.

Inventor.
Jules D. Morel.
By *H. de Vos.*
Attorney. -

UNITED STATES PATENT OFFICE.

JULES DÉsirÉ MOREL, OF ROUBAIX, FRANCE.

MACHINE FOR CLEANING RAW FILAMENTOUS SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 638,849, dated December 12, 1899.

Application filed December 16, 1897. Serial No. 662,169. (No model.)

To all whom it may concern:

Be it known that I, JULES DÉsirÉ MOREL, a citizen of the Republic of France, and a resident of Roubaix, France, have invented an
5 Improvement in Machines for Cleaning Raw Filamentous Substances, of which the following is a specification.

This invention relates to a machine for cleaning raw filamentous substances—that is
10 to say, those which have not been submitted to a washing action—thus allowing the usual carding operation to be dispensed with. With this machine the substance—such as wool, cotton, and the like—is freed from its impuri-
15 ties—such as foreign vegetable substance, earth, sand, straw, &c.—prior to being washed and without any preliminary preparation other than picking, this latter operation being performed only when it is judged neces-
20 sary. I may here mention the considerable and practical advantages which result from this mechanical treatment of wool before it is washed.

First. During the operations of feeding the
25 fibers into the machine and stretching them a large proportion of the impurities is eliminated, from which it results that when the material is subsequently washed the washing takes places under vastly better conditions
30 than is at present the case. The waters are less less charged with earth and sand, the potash extracted is purer. There is also an economy of water, soap, and of time, as the troughs need not be so frequently emptied. The wash-
35 ing has likewise a greater effect, acting as it does upon wool in ribbons or strips.

Second. Vegetable impurities are much more readily removed previous to washing, which softens them and allows them to stretch,
40 divide, and become more intimately mingled with the fibers, more especially subsequent to the action of the pressing-cylinders.

Third. With the treatment hitherto employed—that is to say, previously washing
45 the wool—the vegetable and other impurities, which comprise, essentially, coloring-matters, yield a considerable part of such matters to the washing-waters, which become yellow. The wool immersed in this bath necessarily
50 becomes more or less impregnated with such coloring-matter. Earth also colors the wash-

ing-waters. These disadvantages are obviated by my improved machine.

Fourth. My machine stretches the wool much more readily, owing to the presence of
55 natural grease, which preserves its flexibility and elasticity. The work of the combing-machine is therefore considerably reduced.

Fifth. As regards the resulting product the fibers having been less strained than by the
60 use of the machines hitherto employed (the carding-machine especially) there is no flock or waste. The noils pass partially into the worsted yarn. The quantity of the combed or worsted yarn is consequently greatly in-
65 creased, while at the same time being of finer quality. The spinning and afterward the weaving operations likewise benefit from various points of view from this superior quality
70 of wool treated in this manner. In drying it will be certain that no inequalities will exist either in the ribbons of combed or worsted yarn or in the fabric. In short, the advantages resulting from the employment of this
75 improved process are manifold and will be obvious to those acquainted with the art.

In order that the arrangement of the parts of which the machine for cleaning and preparing raw wool may be readily understood, I have illustrated the same in the accompany-
80 ing drawings, in which—

Figure 1 is a side view of my improved machine. Fig. 2 shows a longitudinal section of the machine with some parts in elevation. Fig. 3 is a plan view of the machine. Figs.
85 4, 5, and 6 illustrate details of the fleece-regulator.

The path of the material through the machine is shown by a dotted line in Fig. 2.

The drum A, Figs. 2 and 4, is furnished with
90 pins in quincuncial arrangement and provided with rounded ends, so that they may penetrate the fibrous mass without breaking the impurities. The wool is fed, or rather engaged, by hand upon the drum A. The
95 fibers are retained upon the pins of said drum for a portion of their length. The other portion is pendent in front of said drum, which, owing to its rotary movement, brings this
100 free portion of the fibers into contact with the endless apron or sheet B, which moves more quickly than A. This sheet B in its motion

carries along the free portions of the fibers, carrying them forward with relation to their point of attachment to the drum A, the pins of which, owing to their inclination, support them and present them to the feed-cylinders C D, which seize them as they arrive. By this method of feeding the raw wool it is partially rendered parallel when it reaches the feed-cylinders C D.

The cylinder C is provided with brushes having short bristles, which press the fibers into the covering of the cylinder D and there support them while the stretching action of the drum E, which will hereinafter be described, is taking place.

The cylinder D is provided with flat iron wire having rounded teeth, such as shown in my United States Patent No. 619,979, dated February 21, 1899, which cannot either pierce or cut the impurities.

The feed-cylinders C D present the fibers to the drum E, which is also provided with wire having rounded teeth in the same manner as the cylinder D.

The drum E, rotating with greater speed than the cylinders C D, stretches the fibers as they advance and carries them away as soon as their extremities leave said cylinders C and D. These stretched fibers are removed from the drum E by the brush F, Fig. 2, which carries them into the notches and grooves of the cylinder G. This cylinder G is a drum on which are formed circular or helicoidal grooves combined with transverse or oblique grooves, as in my Patent No. 619,979, before mentioned. The vegetable impurities, straw, and the like not being able to enter the small notches or grooves remain upon the surface of the drum G and are thrown entire upon the plate L at the moment when they meet the blades of the picker K, Fig. 2. Owing to the great speed of the picker K and in order to avoid the prejudicial ventilation that would be caused if the blades were too long I provide the cylinder with slightly-projecting blades 7, as in my patent before mentioned. After the removal of the impurities the fibers are conveyed from drum G to one of the drums N or N' by means of a brush M. Two plates T and T' prevent impurities that may emanate from brush F or picker K from falling upon the prepared wool.

In order to insure a continuous operation, I place upon a common shaft O, Figs. 1, 2, and 3, two drums N and N', that are alternately placed in front of the before-described parts when the fleece is thick enough. This arrangement allows of the removal of the fleece from the drum N or N' as they are alternately disengaged. In this manner the repeated interruptions are done away with, such interruptions being both prejudicial and unavoidable if only one drum were provided. The drums N and N', Figs. 1, 2, and 3, provided with needles forwardly inclined with regard to their direction of rotation, operate alternately with the brush M and form fleeces

in their needles, the thickness of which fleeces may be caused to vary by means of a regulator, hereinafter described, and acting upon one of the extremities of the shaft O, carrying the drums N and N'. The drum N is keyed upon shaft O, which can slide in its bearings. This shaft carries a fixed pulley O' and an idle pulley O''. The drum N' is idle on the shaft O, being keyed on a boss U. (Shown in dotted lines in Fig. 3.) This boss is also idle on the shaft O, and rigidly mounted upon said boss is a pulley U', said boss also carrying an idle pulley U''. Steel bands *a*, operating as brakes, will be provided for each of the fixed pulleys O' and U', as illustrated, applied to the pulley U', so that when the pulley is shifted it will fit within said brake-band. One end *e* of each of said brakes is fixed, and the other end is movable and connected to a lever *c* with pedal *b*, pivoted at *d*, Figs. 1, 2, and 3. Slightly forward of the pivot *d* each of the levers *c* will be jointed to an arm *c'*, supporting a roll P, which in normal position—i. e., when the pedal *b* is not pushed down—rests by its own weight upon another roll R. The drums N and N', the fixed and idle pulleys, the brakes, and the rolls P and R being arranged as described and in the position shown in Fig. 2, it will be seen that the pulley O' imparts motion to drum N, placed in front of the machine, and that the drum N' is in rest, the belt running over the idle pulley U''. The complete stop of the drum N' is caused by the shifting of the belt and the action of the brake *a*, connected to lever *c* and pedal *b*, which while being pushed down has raised the roll P out of contact with the roll R. In the space between these two rolls is passed a cutting-blade, and between the needles of drum N', in order to cut the fleece. One of the ends of the fleece is then drawn in the space between rollers P and R, and the pedal *b* is then released. By imparting to one of these rolls a rotary motion, which is at once communicated to the other, the fleece is withdrawn from the drum. The fleece being thus removed from, say, drum N', the drum N is meanwhile in operation, and the drums are then automatically shifted, as hereinafter described, N' taking the place of N, the belt passes from O' to the idle pulley O'', the brake *a* acts, and N comes to a stop. The belt is at the same time shifted from idle pulley U'' to fixed pulley U', and drum N' becomes operative.

The automatic shifting of the drums N and N' is obtained by means of a regulator, which I will now describe. Upon the shaft *g* of the machine, Figs. 1, 2, 3, and 4, is fixed an endless screw *g'*, driving a pinion *h*, fixed upon the shaft *r*. At the opposite extremity of the said shaft is fixed a pinion *j*, driving the gear-wheel *k*, which carries an eccentric-pin *l*, moving in a slot *m* in the lever *n*, Figs. 4 and 5. The lever *n* is guided above upon a fixed pin *o*, which permits it, by means of the slot *p*, to slightly rise and fall. To the lower extremity

of the lever *n* are fixed two grooved rollers *r* and *r'*, in which passes a metal rope or a chain *s*, one extremity of which is attached to a ring *t*, which is loose upon the shaft *O* and held in place by the rings *u* and *u'*, fixed upon the shaft *O*. To the other end of the chain *s*, which passes over the grooved pulleys *v*, is suspended a weight *x*. Between the two rings *u* and *u'* passes a small lever *y*, connected with the free ring *t* and which a counterweight *z* tends to cause to assume a horizontal position. This lever *y* slides along and beneath a fixed rod 1, provided at each extremity with recesses or notches 2 and 3 for the alternate reception of the lever *y*. A movable rod 4, sliding against the fixed rod 1, has at each of its extremities projections 5 and 6. If we suppose the lever *y* to be engaged in the notch 3, the shaft *O* is then held in place and cannot move either to the right or left. The pin *l*, acting upon the lever *n*, pushes it toward the notch 2. The chain held at 3 will slide upon the grooved rollers *r* and *r'* and will cause the weight *x* to rise through a certain distance. When the lever *n* arrives at the end of the stroke for which it is regulated, it pushes the movable rod 4, and the projection 6 will bear against the lever *y*, causing it to fall until it leaves the notch 3. At this moment the weight *x* being released will take with it the chain, which, attached to the loose ring *t*, will bring it to the side upon which are now the grooved rollers *r* and *r'*; but at the end of the travel the lever *y* will meet and enter the notch 2. The shaft *O* is again held in place until inversely the release of the lever *y* is effected by means of the projection 5—that is to say, when the lever *n* has been brought to the other extremity of the fixed rod 1 and has pressed against the movable rod 4. The counterweight *x* will then act in the opposite direction—that is to say, it will cause the lever *y* to again enter the notch 3. The shaft *O* takes the fleecing-drums *N* and *N'* alternately to the right and to the left in order to put them into operation. All that is necessary, therefore, in order to vary the thickness of the fleece is to cause the gear-wheel *k* to move more or less rapidly. The more rapid its movement the thinner will be the fleeces, and vice versa.

After being treated in my machine the wool need not go through the carding-machine. It passes directly to the preparing-machines before the combing-machine. Wool which is a little short—as, for instance, lamb's-wool—which could not be engaged in the pins upon the drum *A*, is placed upon the sheet *B*, Fig. 2, which conducts it to the feed-cylinders *C* and *D*. The fleeces of raw wool united into ribbons then pass into the baths in order that they may be washed before reaching the combing-machine. In cases in which washed wool is treated in my improved machine the fleeces united into ribbons pass directly to the combing-machine. Wool thus prepared

and cleaned in a raw state not being weakened or strained in the carding-machine, the absolute preservation of the material in its entire length is obtained, and this same material having been less strained by the operation preserves its entire elasticity, softness, and flexibility.

What I claim is—

1. In a machine for preparing and cleaning raw wool, that is to say freeing it from the impurities which it contains such as earth, sand, vegetable impurities and straw prior to any washing operation, the combination with a drum *A* provided with pins the extremities of which are rounded in order that they may not penetrate the vegetable and other impurities, of an endless sheet *B* to engage the pendent extremities of the fibers upon said drum, two feed-cylinders *C* and *D*, one of which has rounded teeth, to carry the fibers from the drum to a feed-cylinder, and the other cylinder having short bristles, a second drum *E* having rounded pins and rotatable at a higher speed than the feed-cylinders for stretching the fibers, a brush *F* to receive and act upon the fibers from drum *E*, and a cylinder *G* to receive the fibers from said brush, substantially as described.

2. In a machine for preparing and cleaning raw wool, the combination with a drum *A* provided with pins, the extremities of which are rounded, of an endless sheet *B* to engage the pendent extremities of the fibers upon said drum, two feed-cylinders *C* and *D*, one of which has rounded teeth to carry the fibers from the drum to a feed-cylinder, and the other cylinder having short bristles, a second drum *E* having rounded pins and rotatable at a higher speed than the feed-cylinders for stretching the fibers, a brush *F* to receive and act upon the fibers from drum *E*, a cylinder *G* having longitudinal and transverse grooves of sufficient width to allow the fibers of wool to penetrate therein but not sufficient to allow the admission of vegetable and other impurities so that they may remain upon the surface of the cylinder, a picker *K* to remove said impurities from the surface of said cylinder, and a plate *L* to receive the impurities removed by said picker, substantially as described.

3. In a machine for preparing and cleaning raw wool, the combination with the grooved cylinder *G* and the brush *M* to free it from the raw and purified material, of the two independent cylinders movable sidewise to and from the cylinder *G* in order that one of said cylinders may receive the material from cylinder *G* while the material received therefrom by the other cylinder may be removed from it, substantially as described.

4. In a machine for preparing and cleaning wool, the combination with the grooved cylinder *G* and the brush *M* to free it from the raw and purified material, of the two independent cylinders movable sidewise to and

from the cylinder G in order that one of said cylinders may receive the material from cylinder G while the material received therefrom by the other cylinder may be removed from it, and the rolls P, R for removing the material from said two independent cylinders, substantially as described.

5. In a machine for preparing and cleaning wool, the combination with the grooved cylinder G and the brush M to free it from the raw and purified material, of the two independent cylinders movable sidewise to and from the cylinder G in order that one of said cylinders may receive the material from cylinder G while the material received therefrom by the other cylinder may be removed from it, the rolls P, R for removing the material from said two independent cylinders, and a brake for checking the rotation of each of the two independent cylinders, substantially as described.

6. In a machine for preparing and cleaning wool, the combination with the cylinder G, of the fleecing-drum movable to and from said cylinder, and means for regulating the time of movement of the fleecing-drum from said cylinder to regulate the thickness of the fleeces, substantially as described.

7. In a machine for preparing and cleaning wool, the combination with the cylinder G, of a sidewise-movable fleecing-drum adapted to be positioned in front of cylinder G when to receive the material therefrom and moved sidewise thereof when the material is to be removed from it, and means for moving said drum sidewise, substantially as described.

8. In a machine for preparing and cleaning wool, the combination with the drum A, provided with pins for suspending fibers therefrom, of a carrier B, the feed-cylinders C D, and the stretching-drum E of larger diameter than the feed-cylinders and located on the opposite side thereof from the carrier B to receive the material from the feed-cylinders and rotatable at a higher speed than the feed-cylinders, substantially as described.

9. In a machine for preparing and cleaning wool, the combination with the drum A provided with pins for suspending fibers therefrom, carrier B and feed-cylinders C D, of the stretching-drum E of larger diameter than the feed-cylinders and located on the opposite side thereof from the carrier B to receive the material from the feeding-cylinders and rotatable at a higher speed than the feed-cylinders, and the cylinder G for removing impurities from the material, said cylinder being formed

with grooves to receive the wool and exclude foreign substances, substantially as described.

10. In a machine for preparing and cleaning wool, the combination with the drum A, provided with pins for suspending fibers therefrom, carrier B and feed-cylinders C, D, of the stretching-drum E of larger diameter than the feed-cylinders and located on the opposite side thereof from the carrier B to receive the material from the feed-cylinders, the cylinder G for removing the impurities from the material received from the stretching-drum, and the fleecing-drum located to receive the fleece from cylinder G, substantially as described.

11. In a machine for preparing and cleaning wool, the combination with the stretching-drum and the cylinder for removing impurities from the material, of the sidewise-movable fleecing-drum, means for shifting said drum into position in front of said cylinder when to receive material from it and movable sidewise therefrom when to have the material taken from it, and means for controlling the shifting mechanism for regulating the thickness of the fleeces, substantially as described.

12. In a machine for preparing and cleaning wool, the combination with the cylinder G, of the two independent fleecing-cylinders N N' mounted upon the slidable shaft O, the lever c having the brake a connected therewith, and the rod c' connected to said lever and carrying the rolls P, R at its upper portion, substantially as described.

13. In a machine for preparing and cleaning wool, the combination with the fleecing-cylinders N N' and their shaft O, of the ring t on said shaft, the lever y, connected with the ring t, the rods 1 and 4 for said lever y to engage with, the lever n carrying the rollers r and r', the weighted cable s passing between said rollers and connected to the ring t, the shaft i carrying the pinion h at one end and a pinion j at the other end, the gear-wheel k with which pinion j meshes and provided with the eccentric-pin l working in a slot in the lever n, and the gear g' mounted on the shaft g, said parts being arranged to operate substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of November, 1897.

JULES DÉSIÉ MOREL.

Witnesses:

LOUIS CURNIS,
ALFRED LEBLOUET.