(No Model.) 2 Sheets—Sheet 1.

S. B. ALLISON.

MACHINE FOR CLEANING FIBER.

No. 568,225. Patented Sept. 22, 1896.

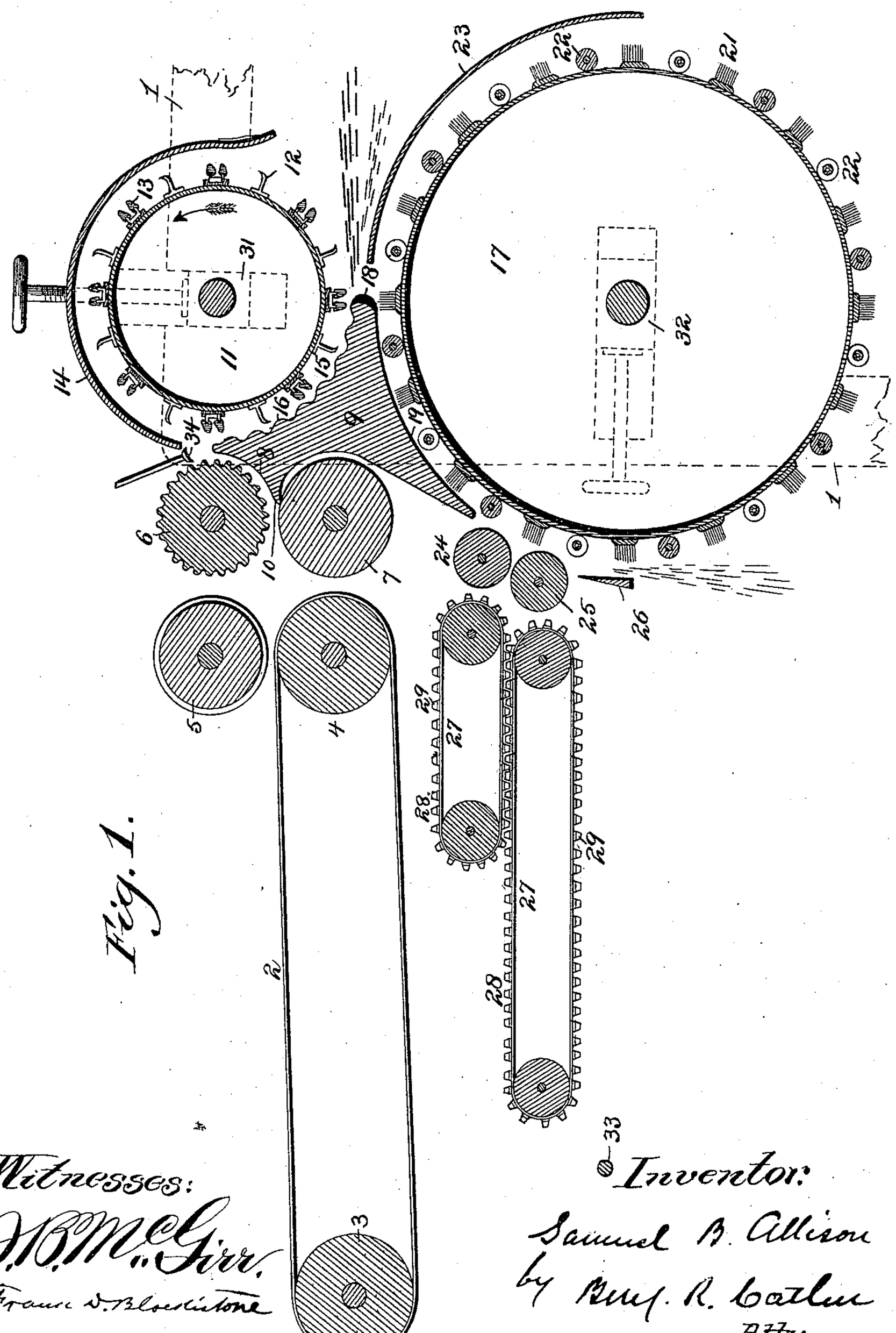

Fig. 1.

Witnesses:
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Frank D. Bloomstone

Inventor:
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(No Model.) 2 Sheets—Sheet 2.

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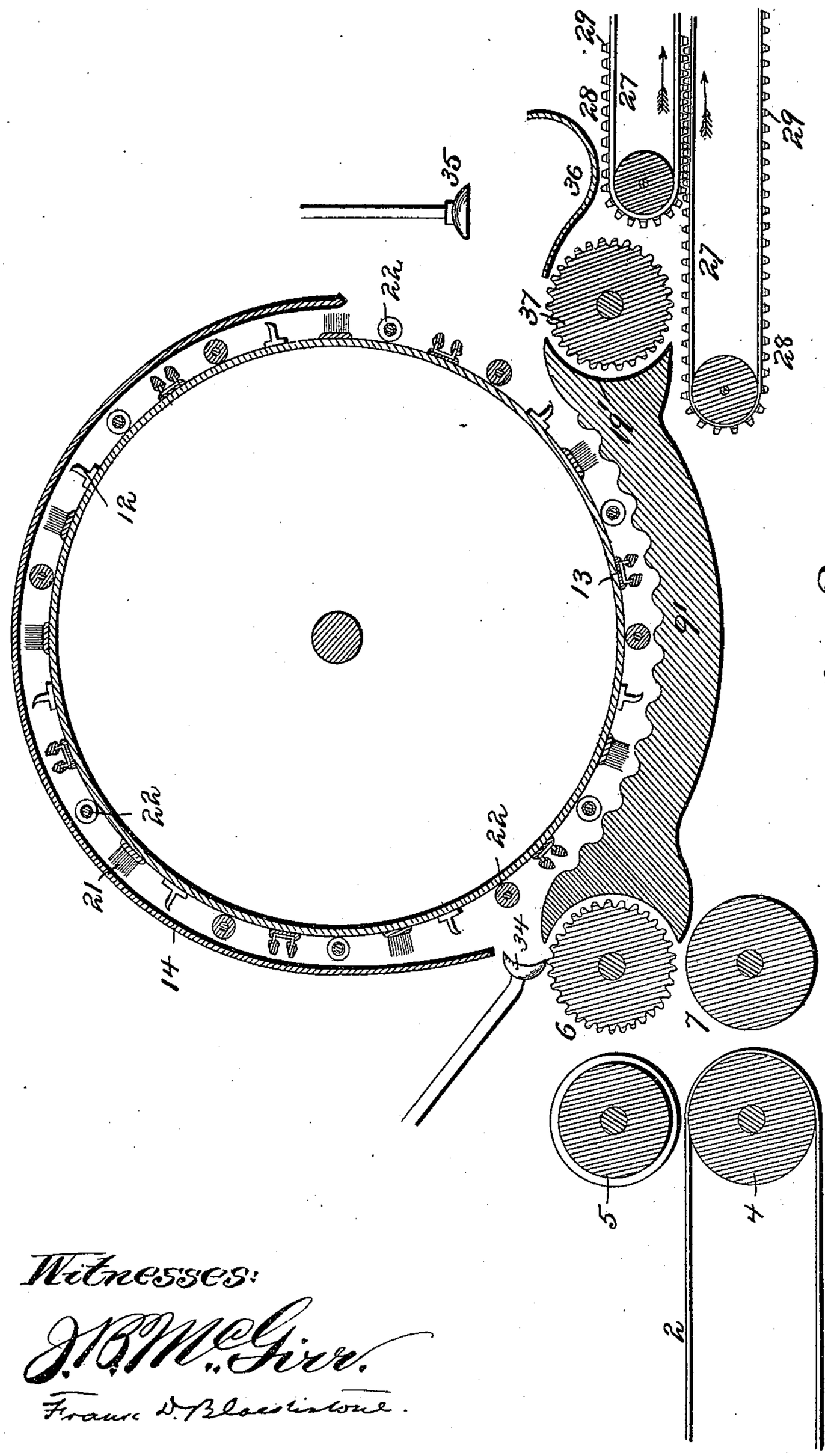

Fig. 2.

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UNITED STATES PATENT OFFICE.

SAMUEL BENJAMIN ALLISON, OF NEW ORLEANS, LOUISIANA.

MACHINE FOR CLEANING FIBER.

SPECIFICATION forming part of Letters Patent No. 568,225, dated September 22, 1896.

Application filed February 24, 1896. Serial No. 580,506. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL BENJAMIN ALLISON, a resident of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Machines for Cleaning Fiber; 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 pertains to make and use the same.

The invention relates to a machine for separating the fibrous and woody parts of various leaves and plants; and its object is to effect this in an economical and efficient manner without rehandling the material; and the invention consists in the matters hereinafter described and particularly pointed out.

In the accompanying drawings, Figure 1 is a partial section of the machine. Fig. 2 is a similar view of a modification.

Numeral 1 indicates the main frame of the machine, shown only in part.

2 is an endless belt to feed stalks, leaves, or the like to the machine.

3 and 4 denote belt supporting and moving rollers. About three-sixteenths of an inch above roller 4 and coöperating therewith is a circumferentially-grooved roller 5 to split the stalks, which are next immediately moved between and transversely broken by a longitudinally-grooved roller 6, coöperating with a roller 7. The woody parts of the stalks having been split and broken are drawn up between roller 6 and a curved bed 8, formed in the adjacent face of a block 9 or other equivalent construction. At the lower end of said bed 8 is a roller-scraping edge 10, adapted to clear roller 7 and guide the material upwardly.

11 denotes a scutching-roller provided with curved blades 12 and elastic rubbing-bars 13 or other like devices. This roller rotates in the direction of the arrow under a hood or cover 14, and by means of the air-current thus generated and the coöperating effect of the said blades and bars the material is bent across the upper edge of the block and down between the roller and said block, which latter has a longitudinally grooved or corrugated working bed 15, conforming to roller 11.

16 indicates the ribs, corrugations, or projections on the bed. The corrugated bed may extend below to about the vertical central plane of the roller.

23 denotes a guard to prevent the refuse woody fragments carried beyond the edge of the bed 15 from falling onto a roller 17, situated below. The block 9 preferably extends under roller 11 near to or beyond its vertical central plane to prolong its curved bed 15, so that its lower extremity has nearly a horizontal situation. The lower edge of the bed 15 may be protected, if desired, with elastic material 18. At this edge the curtain of fiber is largely separated from the broken wood, which is driven and blown out in an approximately horizontal direction, as indicated. The sliver falls and is drawn in between a smooth concave bed 19 and the roller 20, provided with brushes 21 and circumferentially-grooved rotating combing-rollers 22. The latter comb the sliver and straighten the fibers, and the brushes separate therefrom more of the refuse wood.

The guard 23 is curved about roller 17, as indicated, and together with the working bed 19 incloses an air-space through which rushes a current generated by the rapid rotation of said roller. By the said air-current and the centrifugal action of the brushes and bars the fiber is wafted between small gripping-rollers 24 and 25, the separated wood being dropped between the roller 17 and a guard or guide-plate 26. From the gripping-rollers the fiber passes between the endless belts 27, suitably supported and moved by rollers, as shown, the arrows indicating the direction of the movement.

Upon the belts are secured transverse combing and rubbing or scraping bars 28, which are preferably provided with teeth, (indicated at 29.) These bars mesh and draw, rub, and comb the fiber thoroughly, disengaging woody remnants and fine refuse, which fall on the lower belt between its bars and may be dumped at the outer end of said belt. The lower belt may be made longer than the upper to provide a support for the cleaned fiber, adapted to permit its manipulation thereon, or the fiber may be dropped onto a bar 33 or onto a carrier.

The roller 11 is adjustable to and from the

bed 15 by means of devices of usual construction, (indicated at 31.)

32 indicates like devices for adjusting roller 17 to and from bed 19. These adjustments will be made according to the character and condition of the material under treatment.

The improvement is not limited to particular dimensions; but I have found that feeding-rollers of five inches diameter run at a speed of fifty feet per minute. Scutching-rollers of eight inches diameter and brushing-rollers of sixteen inches diameter are very suitable.

Each roller or belt will have a greater velocity than its predecessor, in order to keep the fiber taut and draw it through the machine. The blades and bars of the scutching-roller may have a velocity of from two thousand four hundred feet to about two thousand six hundred feet a minute and the brushes and combing-rollers a velocity about five times as great, by which the sliver will be very efficiently brushed, straightened, and rubbed against the smooth bed 19. The combined action of the scutching-blades cooperating with the ribs or projections of bed 15 and the extension of said bed toward an exit between the scutching and brushing rollers, as set forth, so that woody fragments are first beaten loose and then thrown out of the machine, as indicated, are important features of the improvement. The guard or guide-plate 23, which serves to protect the brushing-rollers from falling refuse and coöperates with the bed 19 and the rapidly-rotating roller 17 to produce an air-current, is believed to be new in the combination specified and also the parallel belts provided with meshing devices to clean the fiber as it is drawn from the machine, which matters, together with the others, will be particularly pointed out in the claims.

In Fig. 2 is illustrated a machine comprising modifications. The rotating frame is made larger and preferably with a diameter of about eighteen inches. 34 denotes a device adapted to sprinkle with water or chemical solutions and also to deflect the stalks, leaves, or plants. 35 denotes a pipe which preferably will carry a sprinkler for washing away refuse blown into the chute 36. A longitudinally-corrugated roller 37 rubs the fiber against a smooth bed 19′, formed in the block 9′. Said block is situated under the rotating frame and extends around its lower side, substantially as indicated, so that its outer end approaches a vertical line tangential to the circumference of the frame, with the effect to direct the separated refuse beyond said line. The length of the block and bed may, however, be varied. Belts 27, provided with bars 28 that mesh, receive the fiber immediately from said bed and roller and effectually rub, comb, and clean the same, as above described in connection with Fig. 1.

In practice the scutching devices carried by the upper frame (illustrated in Fig. 1) will be driven at from three to five hundred rotations per minute and the brushes and combing-rollers at from seven to ten hundred per minute. The devices carried by the rotating frame (illustrated in Fig. 2) may be driven at the rate of about six to seven thousand feet per minute and the material fed at the rate of about fifty feet per minute. The endless cleaning-belts may run about five times as fast as the rubbing-roller 37, which will insure a thorough rubbing, combing, and cleaning action. The speed of the various devices may be varied to suit different conditions of material.

I am aware that endless chains provided with loosely-supported rollers adapted to intermesh and thereby break stalks are not new. My improvement has relation both to the construction and operation of the intermeshing parts or bars and their situation relative to stalk-breaking and wood-separating devices. In my machine the material is first broken and the coarse refuse separated, and then the approximately clean fiber receives a final rubbing action between bars fixed to carrying-off belts, the latter being thereby put to a new use. Said bars fixed to the belts intermesh in close contiguity as suitable for the nearly-finished product, and they rub the fiber with the effect to loosen and separate fine refuse, which drops upon the lower belt between the bars and is separately carried out of the machine. The bars are also preferably notched or toothed to separate the sliver or curtain into parts situated in different planes, whereby the discharge of refuse is further facilitated.

I am also aware that endless belts have been employed to remove the sliver from the machine. It is characteristic of my improvement that belts are provided with devices suitable to act closely upon the sliver after the woody refuse has been discharged therefrom, the purpose being to remove the fine filaments of fiber and minute particles often found in so-called "cleaned" fiber, said belts being adapted to deliver the final product of the machine.

Having thus described my invention, what I claim is—

1. In a machine for separating the fiber of plants, the combination of feeding-rollers, a working bed conforming to the upper feeding-roller, a roller carrying fiber-cleaning devices, a curved working bed conforming thereto, a curved bed adjacent to and reversely situated with respect to the second-named bed and joined thereto by a fiber-bending edge, a roller carrying fiber-cleaning devices situated adjacent said latter bed, and a guard to prevent woody fragments from falling on the latter roller and to direct an air-current under the last-named bed, substantially as described.

2. In a machine for separating the fiber of plants, the combination of feeding-rollers, a working bed conforming to the upper feed-

ing-roller, a roller carrying fiber-cleaning devices, a curved working bed conforming thereto, a curved bed adjacent to and reversely situated with respect to the second-named bed and joined thereto by a fiber-bending edge, a roller carrying fiber-cleaning devices situated adjacent said latter bed, a guard to prevent woody fragments from falling on the latter roller and to direct an air-current under the last-named bed, fiber-gripping rollers, and parallel endless belts provided with fiber-treating devices to receive the fiber from the gripping-rollers, substantially as described.

3. In a machine for separating the fiber of plants, the combination of plant-feeding rollers, plant-breaking devices, refuse-separating and fiber-treating devices and parallel endless belts situated at the delivery end of the machine and adapted to carry the approximately clean fiber out of the machine, said belts having intermeshing devices to closely press and rub the sliver to liberate fine residual refuse, substantially as described.

4. In a machine for separating the fiber of plants, the combination of plant-feeding rollers, fiber treating and conveying devices and parallel endless belts situated at the delivery end of the machine to receive the approximately clean fiber and carry it out of the machine, said belts having intermeshing fiber-cleaning devices consisting of transverse bars fixed to the belts contiguous each other and adapted to press and rub the fiber, substantially as described.

5. In a machine for separating the fiber of plants, the combination of plant-feeding rollers, fiber treating and conveying devices, and parallel endless belts situated at the delivery end of the machine to receive the approximately clean fiber and carry it out of the machine said belts having intermeshing fiber-cleaning devices consisting of transverse bars fixed to the belts contiguous each other and adapted to press and rub the fiber, the cleaning devices having spaces between them on the surface of said lower belt to hold and carry said refuse while the fiber rests on the bars, substantially as described.

6. In a machine for separating the fiber of plants, the combination of plant-feeding rollers, devices to break the plants receiving the same from the feeding-rollers, devices to separate fiber and refuse arranged to act after the breaking devices, gripping-rollers to receive the fiber from the refuse-separating devices, and parallel endless belts situated at the delivery end of the machine and having intermeshing fiber-cleaning devices, said separating devices being adapted to closely rub and press the sliver and the belts adapted to move the fiber out of the machine, substantially as described.

7. The combination of a rotating frame provided with fiber-cleaning devices, a block having a working bed conforming thereto, a working bed formed in the block on a side opposite the bed first named, a guard to guide refuse separated on the first bed out of the machine, a passage for fiber between said block and guard, and a roller to rub the separated fiber against said second bed, substantially as described.

8. The combination of a rotating frame provided with fiber-cleaning devices, a block having a working bed conforming thereto, a working bed formed in the block on a side opposite the bed first named, a guard to guide refuse separated on the first bed out of the machine, a passage for fiber between said block and guard, and a roller to rub the separated fiber against said second bed, said guard being adapted on its under side to direct air against fiber moving through said passage, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

SAMUEL BENJAMIN ALLISON.

Witnesses:
J. C. S. CHURCHILL,
GEO. W. MOORE.