

No. 884,635.

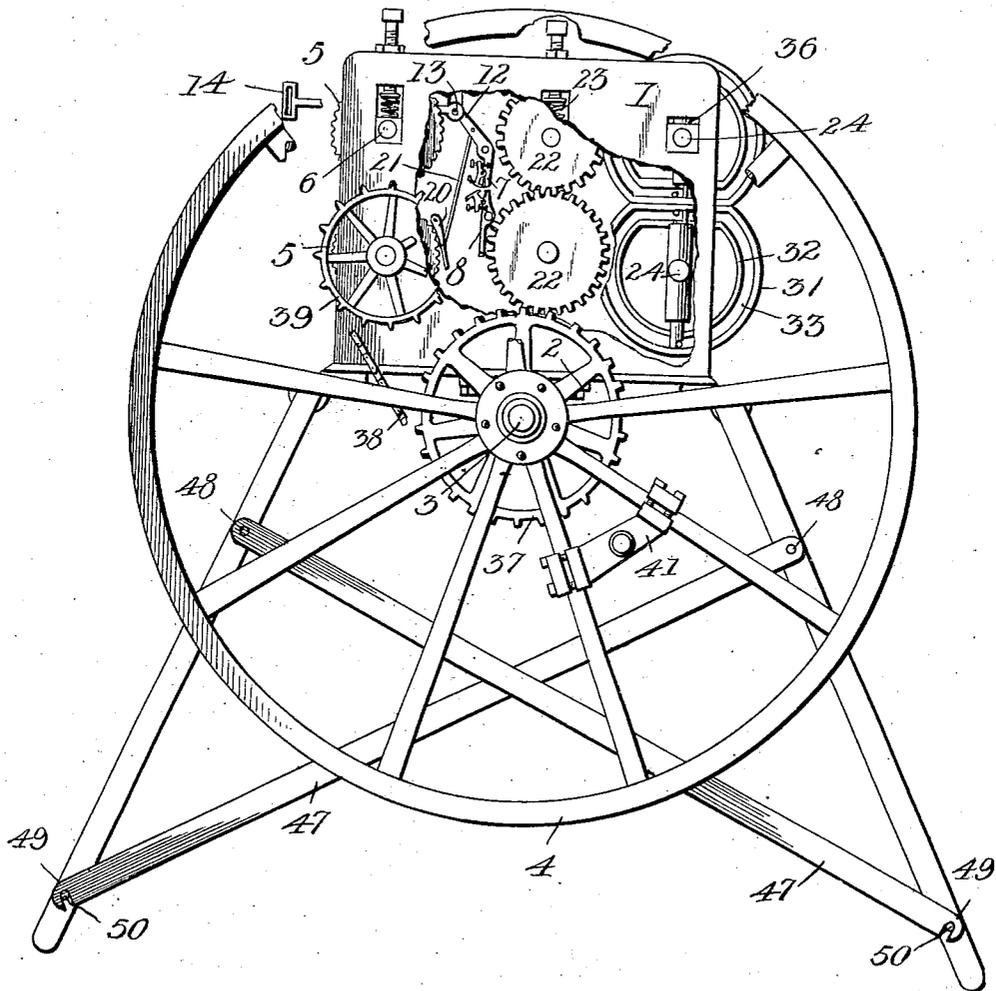
PATENTED APR. 14, 1908.

H. E. BRYANT.
FIBER SEPARATING MACHINE.

APPLICATION FILED JAN. 14, 1907.

3 SHEETS—SHEET 1.

FIG. 1.



Witnesses

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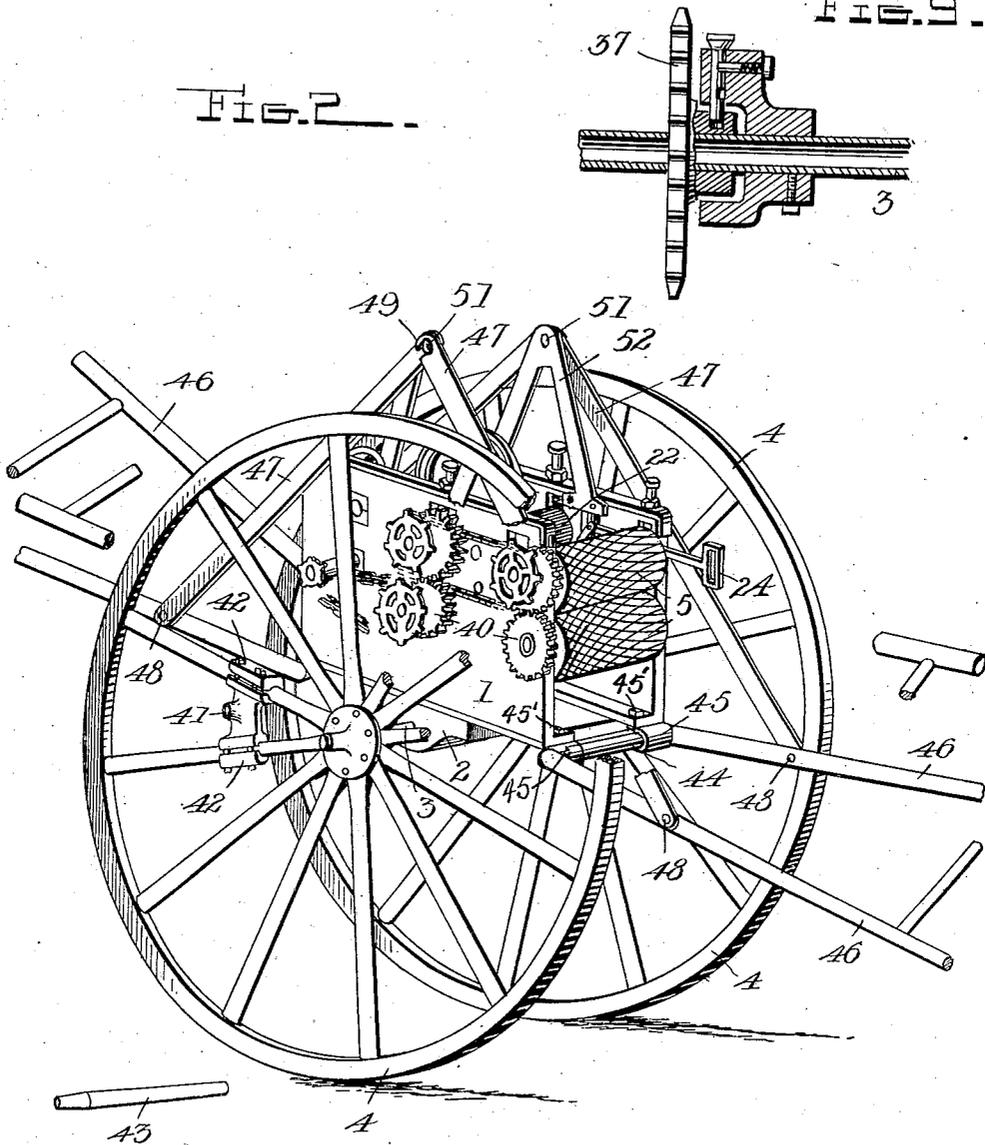
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3 SHEETS-SHEET 2.

Fig. 2.

Fig. 3.



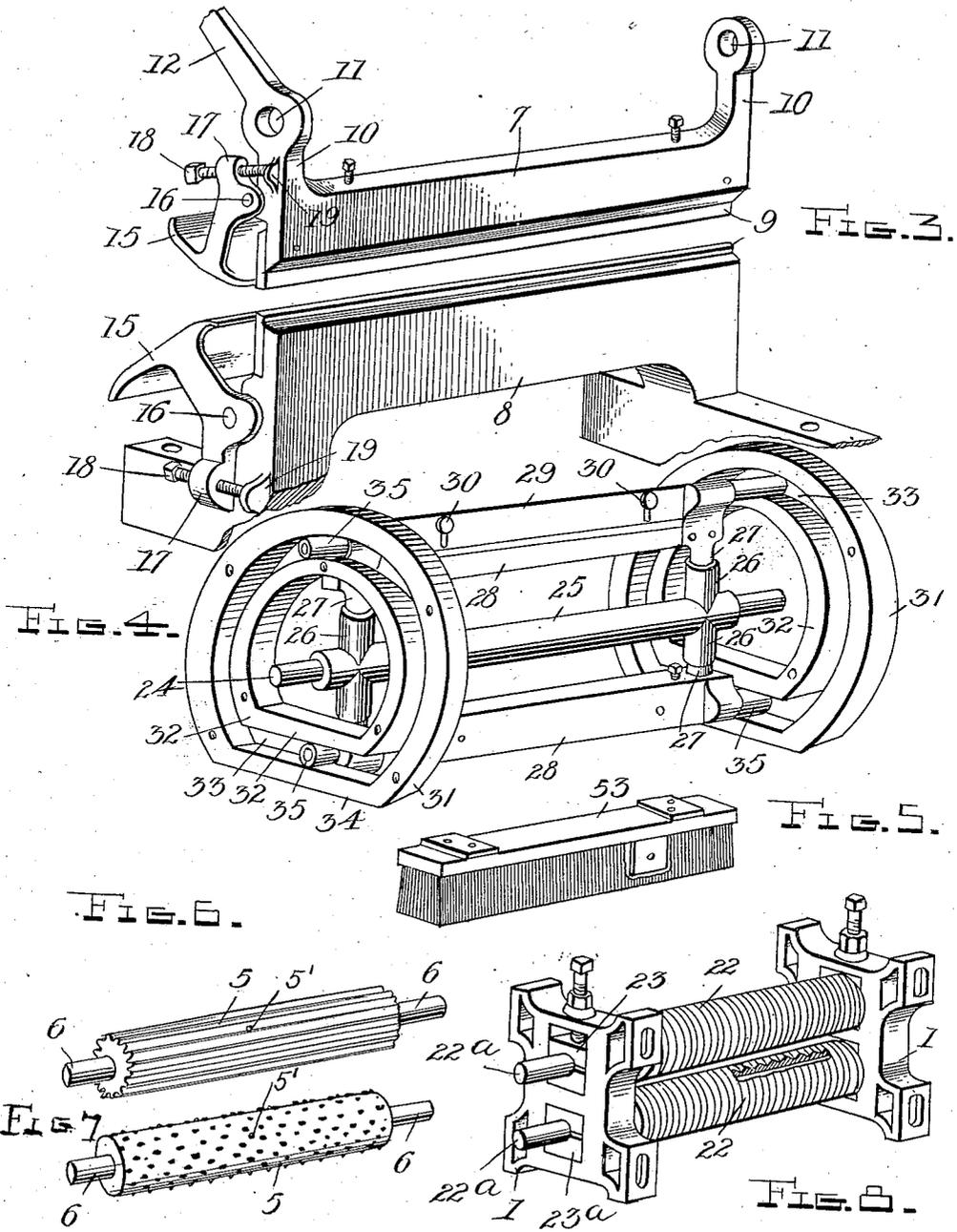
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HENRY E. BRYANT, OF PAWTUCKET, RHODE ISLAND.

FIBER-SEPARATING MACHINE.

No. 884,635.

Specification of Letters Patent.

Patented April 14, 1908.

Application filed January 14, 1907. Serial No. 352,237.

To all whom it may concern:

Be it known that I, HENRY E. BRYANT, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Fiber-Separating Machines, of which the following is a specification.

This invention relates to new and useful improvements in machines for extracting fibers from the leaves of fiber producing plants and it has particular reference to a machine of this type including means for initially crushing the shell of the leaf and reducing it to a soft mass of pulp and fiber and for subsequently separating and disposing of the fiber and the pulp.

In the art as ordinarily practiced, a great disadvantage resides in the fact that the fiber during the separating or extracting process is subjected to too great a strain and frequently breaks, thus reducing its market value. It has been sought to overcome this objection by operating the machine at a reduced rate of speed but this method is objectionable for the reason that the output is reduced and a consequent loss involved.

It is therefore a primary consideration of the present invention to provide a fiber extracting machine, in which the strain on the fiber is reduced to a minimum and which at the same time may be run at the highest speed attainable.

The invention likewise contemplates important subsidiary objects, including the provision of novel means which in one position serve as a stationary support and in another position serve as tongues or shafts whereby the machine may be readily moved from place to place.

It is a further object of the invention to provide novel actuating means including traction wheels which in one position are designed to have operative engagement with the transmission gearing, and in such relation to serve as balance or drive wheels.

The invention also resides in the provision of novel details of construction and arrangement which will appear in the course of the following description, in which reference is had to the accompanying drawings forming a part of this specification, like characters of reference designating similar parts throughout the several views, wherein

Figure 1 is a side elevation of a fiber extracting machine constructed in accordance

with my invention and in its stationary or operative position. Fig. 2 is a perspective view of the same as seen from the front and in position to be moved with the parts in inoperative relation, Figs. 3 to 8 are detailed perspective views of elements to be hereinafter specifically, referred to, and Fig. 9, is a section of the clutch mechanism.

The machine embodied in the present invention comprises essentially a frame 1 in which the operating parts are mounted, brackets 2 depending from the frame, an axle 3 supported in said brackets and traction wheels 4 provided upon said axle.

In the forward part of the frame 1 are mounted superposed pulping rollers 5, the function of which is to break the shell of the leaf and soften its mass preparatory to the scraping and separating operations. The uppermost of the rollers 5 has adjustable yieldable journals 6 of conventional form which are best shown in Fig. 1. Rearwardly of the rollers 5 an initial scraping mechanism is provided which comprises upper and lower beams 7 and 8 illustrated in detail in Fig. 3 and having confronting closely associated scraping blades 9. The upper beam 7 is provided with vertical side arms 10 having pivot apertures 11 for the reception of stationary pivot pins fixed to the frame 1. One of the arms 10 has an angular extension 12 which at its end is pivoted as at 13 to a slidable operating handle 14. Adjacent the blades 9 transverse guide plates 15 are provided. The plates 15 are pivoted as at 16 to the sides of the beams 7 and 8 and in such relation are adjustable in order to permit of varying their angular disposition in accordance with the differing conditions of use. The plates 15 accordingly at one side thereof have apertured ears 17 through which are threaded adjusting screws 18 bearing against stop lugs 19 provided upon the adjacent sides of the beams 7 and 8. The beam 7 is designed to be swung forwardly on its pivots so as to afford a greater space for the free initial introduction of the leaf between the blades 9 and to be restored to its initial position shown in Fig. 1 after such introduction. Rearwardly of the lowermost roller 5 a guide shelf 20 is pivotally supported as shown in Fig. 1. This shelf 20 serves as a bridge to span the space between the rollers 5 and the scraping blades 9 and to support the leaf as it first passes through said rollers. In this function, said shelf is raised during the forward movement

of the beam 7 and lowered during the rearward movement by means of any suitable connection therebetween, such for instance as a cord or link 21.

5 In the rear of the scraping mechanism above described are mounted feeding or drawing in rollers 22 which are fluted to more effectually grip the fiber and which have their shafts or trunnions supported by the frame 1 in suitable bearing provided therefor. The uppermost of the rollers 22 has adjustable yieldable bearings 23 similar in construction and function to the bearings 6. An additional scraping mechanism is provided rearwardly of the rollers 22. This last named scraping mechanism is designed to effectually complete the work and comprising rotating scraping blades having a novel and peculiar operation. To this end parallel transverse shafts 24 are journaled in the frame 1 and carry sleeves 25 which at their ends are provided with oppositely-extending tubular arms 26. Within the arms 26 are loosely received the conformable supporting posts 27 of cross beams 28. To the beams 28 respective scraper blades 29 are adjustably secured by conventional bolt and slot fastenings 30. It will be noted that the loose interfitting relation of the post 27 in the arms 26 permits of a movement of the former with relation to the latter. Novel means are provided for prescribing the lines of this movement to the best attainment of the functions contemplated, such means comprising outer and inner concentric annuli 31 and 32, illustrated in Fig. 4 and between which a space 33 occurs, affording an annular guide slot as it were. The annuli 31 and 32 are arranged in superposed series on each side of the frame 1 and have flat portions 34 which confront one another, the slot 33 being thus extended in parallel relation for a comparatively short distance for a purpose to be described. The beams 28 at their ends have axially extending studs 35 which are projected into the slots 33 and in such relation coact with said studs to afford means for guiding said beams and the scraper carried thereby in a partial rotary and straight movement during each revolution of the shafts 24. It is preferred to provide the uppermost of said shafts 24 with adjustable yieldable journals 36.

On the shaft 3 a sprocket wheel 37 is provided which serves through a chain 38 to drive a sprocket 39 provided upon the shaft of the lower roller 5. From said last-named shaft the various other rotating elements are driven by a suitable gear train 40 illustrated in Fig. 2. A suitable clutch mechanism (not shown) is interposed between the sprocket 37 and the adjacent traction wheel 4 whereby the former may be engaged with the latter at will to effect an operative and inoperative relation of the

parts. As above intimated during the operation of the machine the wheels 4 are supported above the ground and serve respectively as driving and balance wheels. To the end of driving the apparatus a socket 41 is fixed on the wheel 4 adjacent the sprocket 37 by connections with clamping members 42 fixed to the spokes as is clearly shown in Figs. 1 and 2. A detachable handle 43 is designed to be engaged in the socket 41 in order that the driving wheel 4 may be rotated by hand.

The novel supporting means referred to in the introduction comprises U-shaped members 44 provided at the ends of the frame 1 and having their cross pieces received as pivots in brackets 45 secured by bolts 45', to frame 1. The legs 46 of said members in their lowermost position afford supports for holding the frame in a position where the traction wheels are above the ground, as is shown in Fig. 1. Brace rods 47 are pivoted as at 48 to the upper portions of each of said legs and terminate in hooked ends 49. The rods 47 are arranged in crossed relation and have their hooked ends 49 engaged with pins 50 provided upon the lower ends of the legs 46. When said legs are raised they serve as shafts whereby the apparatus may be pushed or pulled, the wheels 4 resting on the ground as shown in Fig. 2. In this position of the legs 46, the brace rods 47 constitute positive support therefor, as well as reinforcing means, and to this end are swung on their pivot to a position where their free ends coincide. In such coincident relation the hooks 49 are engaged with pins 51 provided upon the bracket 52, carried by the frame 1.

It is preferred to equip the beams 28 with brushes for the purpose of cleaning the fiber after scraping, and also for removing any fiber and extraneous matter which might cling to the rolls 22, after their action. These brushes are designated by the numeral 53 and are illustrated in detail in Fig. 5.

It is well known that in different kinds of leaves the distribution and tensile strength of the fibers vary and it will accordingly be appreciated that no one set of rollers is perfectly adapted for work on the various kinds of leaves from which the fiber is to be separated. In Figs. 6, 7 and 8 I have illustrated different sets of rollers designed for work on different kinds of leaves. Inasmuch as the rollers *per se*, form no part of the invention, it is not deemed necessary to take up in detail their individual construction. They are merely illustrated by way of example. It is preferred to construct the rollers of a cylindrical body separate from the shaft, and to project the shaft through their central axial bore. This arrangement permits of the ready substitution of one roller for another, and will be best understood by referring to Fig. 8, which illustrates a portion of the frame 1,

and arbitrarily, rolls 22; the shaft 22^a thereof being loosely projected respectively through the upper bearing 23, heretofore referred to and through a lower bearing 23^a. In changing the rollers set-screws 5' are first loosened, the shafts withdrawn, the rollers removed, and the shafts then projected through the bearing at one side of the frame, through the rollers and finally through the bearings at the other side of the frame. In addition to changing the brushes, the scraping blades may also be adjusted, in order to better adapt them for use with the varying kinds of leaves.

The operation of the various elements independently has been set forth in the foregoing description. The operation of the machine as an entirety is as follows: The handle 14 is first forced inwardly to raise the beam 7, away from the beam 8, and in this action the shelf 20 is raised in the manner described. The leaf is then introduced between the rollers 5 and during its passage therethrough its shell is broken and is reduced to a pulpy mass. When the leaf has traveled a sufficient distance the handle 14 is pulled outwardly to lower the beam 7 at which time the scrapers 9 will separate the fiber from the pulp. The rollers 22 continue the action thus started and feed the leaf to the rotary scraping mechanism where the scrapers in their straight movement in the same direction and along parallel lines of travel extract the fibers from the pulp and the partially separated shell without subjecting the fibers to any appreciable amount of strain.

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

1. A machine of the type set forth comprising crushing rollers, a scraping mechanism including a stationary knife carrying beam and a pivotally mounted knife carrying beam arranged in parallelism to said first named beam, a pivoted shelf interposed between said rollers and said scraping mechanism, a connection between said shelf and said pivoted beam, and means for moving said pivoted beam.

2. In a fiber separating machine, a frame, fiber separating apparatus carried thereby, traction wheels carried by said frame, gearing interposed between one of said wheels and said apparatus, pivoted legs at the ends of said frame, brace rods pivoted to said legs and designed in one position thereof to engage the adjacent leg, and brackets carried by said frame, said brace rods being designed in another position to support said legs from the ground and engage said brackets.

3. A machine of the type set forth comprising crushing rollers, a scraping mechanism embodying a stationary knife carrying beam and a pivotally mounted knife carrying beam, means for raising and lowering said

pivoted beam with respect to said stationary beam, and means relatively fixed at one end to aline with the crushing rollers and at their free ends being movable to be raised during the raising of said pivoted beam to guide the material being treated to said scraping mechanism and lowered during the lowering of said pivoted beam.

4. In a fiber separating machine, the combination with crushing rollers, of scraping mechanism disposed in juxtaposition thereto and embodying a part capable of raising and lowering movement, and means to bridge the space between said rollers and scraping mechanism to guide the material treated from said crushing rollers to said scraping rollers, said guiding means being raised during the raising of said movable part and when raised alining with the space between said rollers and that between the knives of the scraping mechanism and being lowered during the lowering of said movable part.

5. In a fiber treating machine, the combination with the crushing rollers, of scraping mechanism disposed adjacent thereto and embodying co-acting parts one of which is movable towards and away from the other to thereby occupy operative and inoperative positions respectively, and means to guide the material being treated from said crushing rollers to said scraping mechanism, said guiding means being in inoperative position when said scraping mechanism is in inoperative position, and being in operative position, when the scraping mechanism is in operative position and when in operative position alining with the space between said rollers and that between the knives of the scraping mechanism.

6. In a fiber treating machine, scraping mechanism embodying two co-acting parts, guide plates pivoted to each of said parts and movable independently of the latter and means for increasing or diminishing the space between the outer sides of said plates.

7. In a fiber treating machine, scraping mechanism embodying two co-acting horizontal parts, and guide plates adjustably secured to each of said parts and adjustable independently of the latter, said plates having their operating faces inclined in opposite directions to form a V-shaped mouth therebetween which leads to said co-acting parts.

8. In a fiber treating machine, a scraping mechanism which consists of a pair of spaced shafts, short radial oppositely disposed tubular arms carried adjacent the ends of said shaft, posts loosely engaging in said arms, beams secured to the outer ends of said arms, knives adjustably secured to said beams on the sides of the latter, and means to impart irregular movement to the beams.

9. In a fiber treating machine, scraping mechanism embodying a pair of sleeves, an elongated shaft on each sleeve carrying short

radial oppositely extending tubular arms adjacent each end thereof, beams each carrying posts which loosely engage in said arms, knives on the beams, and means to impart
5 irregular movement to said beams.

10 10. In a fiber treating machine, the combination with crushing rollers, of normally in-operative initial scraping mechanism guiding means receiving the material treated from
15 said crushing rollers to convey the same to said scraping mechanism, drawing in rollers to the rear of the initial scraping mechanism, final scraping mechanism to the rear of said drawing in rollers, and means for actuating
said initial scraping mechanism and said guiding means to operative positions in unison.

11. In a fiber treating machine, means to

first crush the material being treated, stationary scraping means to give the material
an initial scraping, rotating scraping means 20 to finally scrape said material, bridging means interposed between said scraping means to receive the material from the first and deliver it to the second scraping means,
25 and means for operating all of said means in unison.

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

HENRY E. BRYANT.

Witnesses:

ADA E. HAGERTY,
J. A. MILLER.