

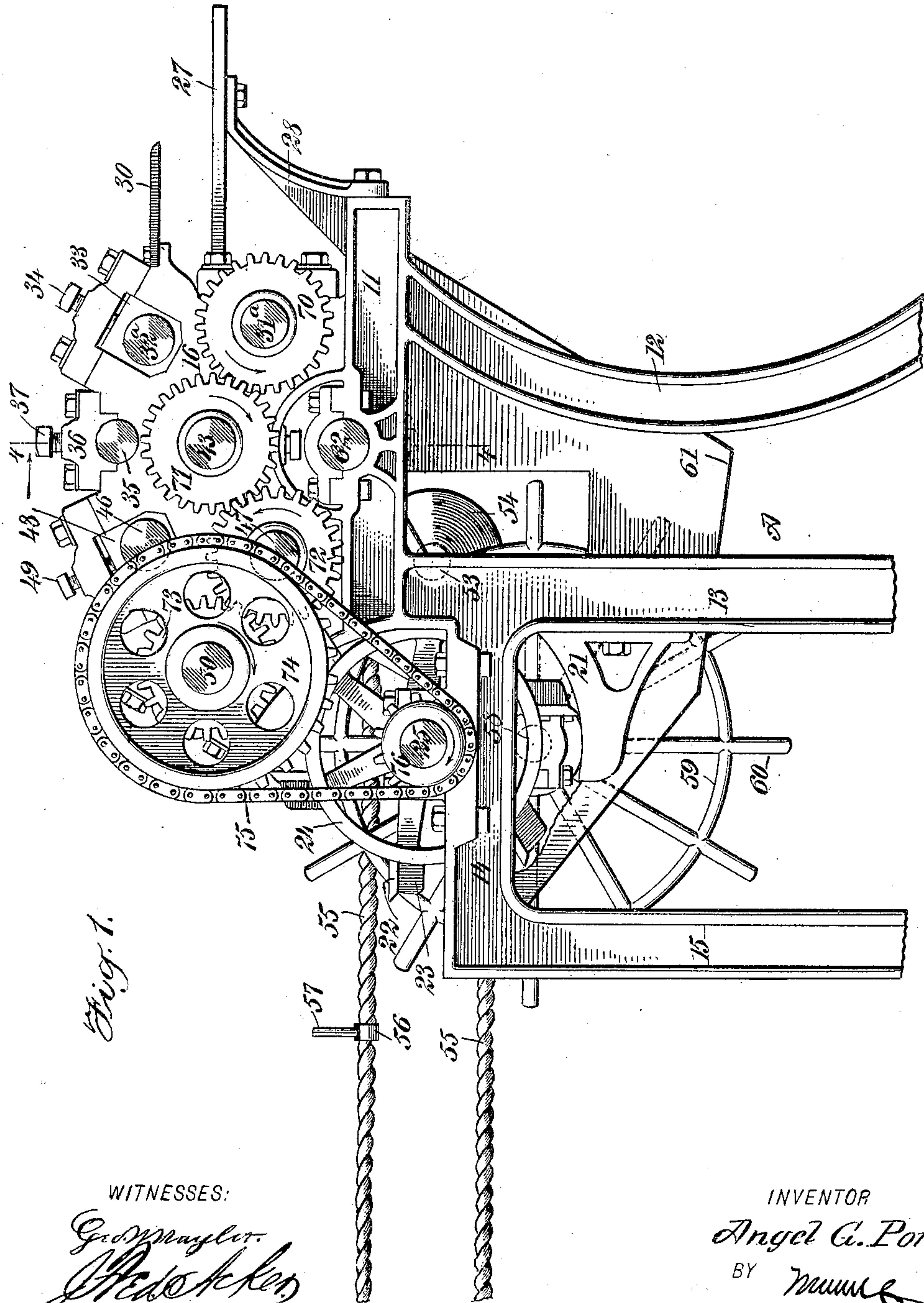
No. 822,767.

PATENTED JUNE 5, 1906.

A. G. PONS.  
FIBER CLEANING MACHINE.

APPLICATION FILED MAR. 10, 1903.

5 SHEETS—SHEET 1.



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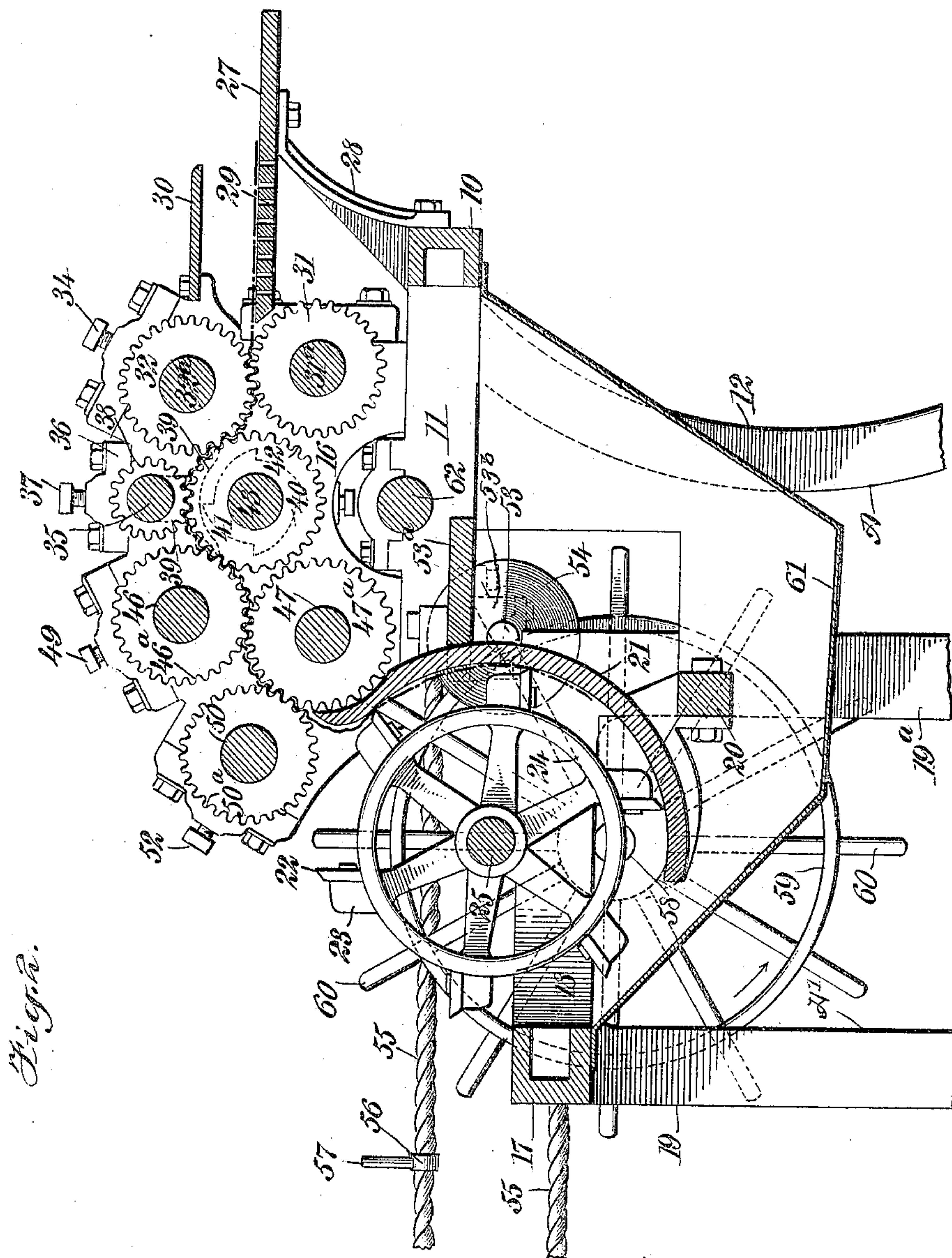
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5 SHEETS—SHEET 2.



*Fig. 2.*

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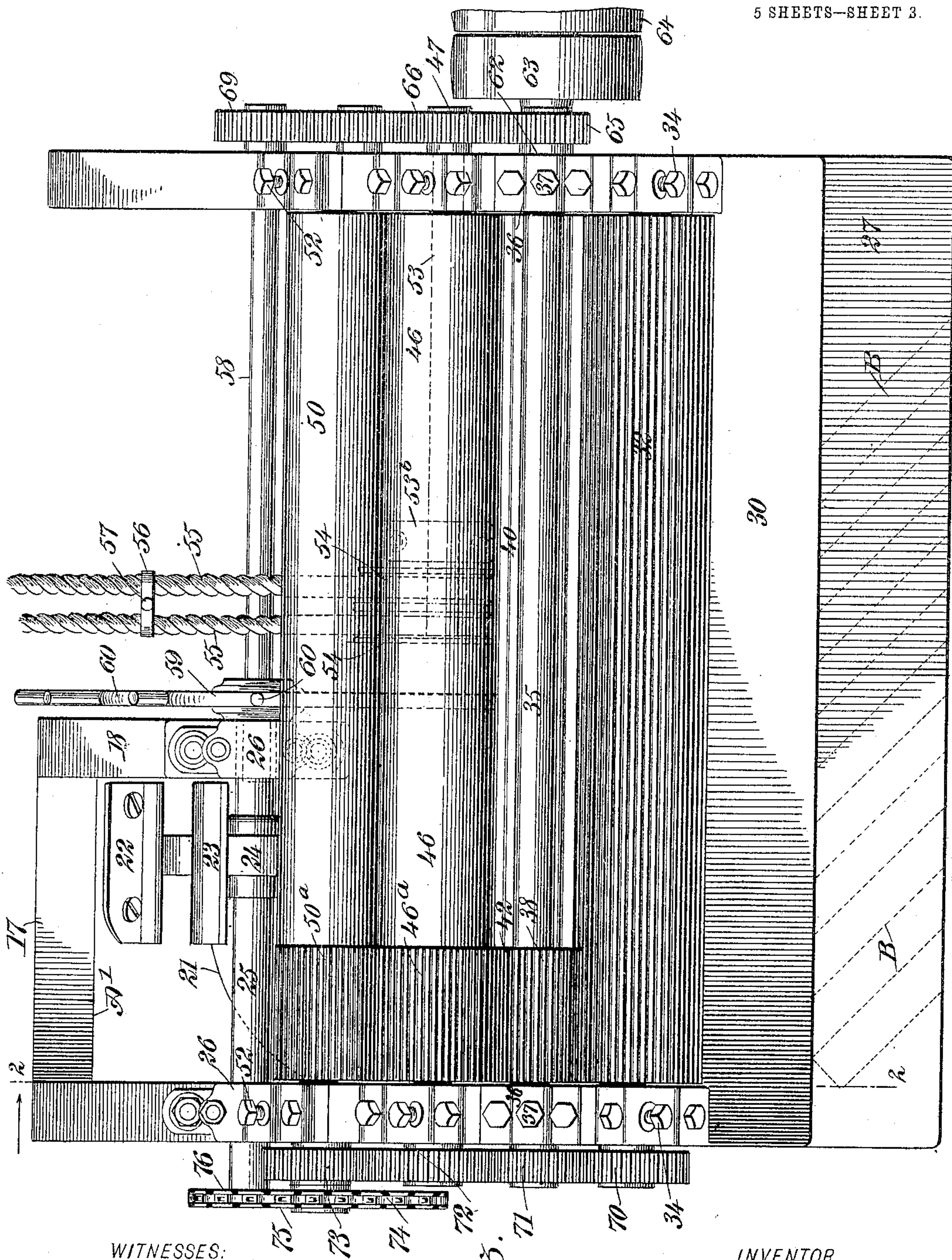
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5 SHEETS—SHEET 3.



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*Fig. 3.*

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No. 822,767.

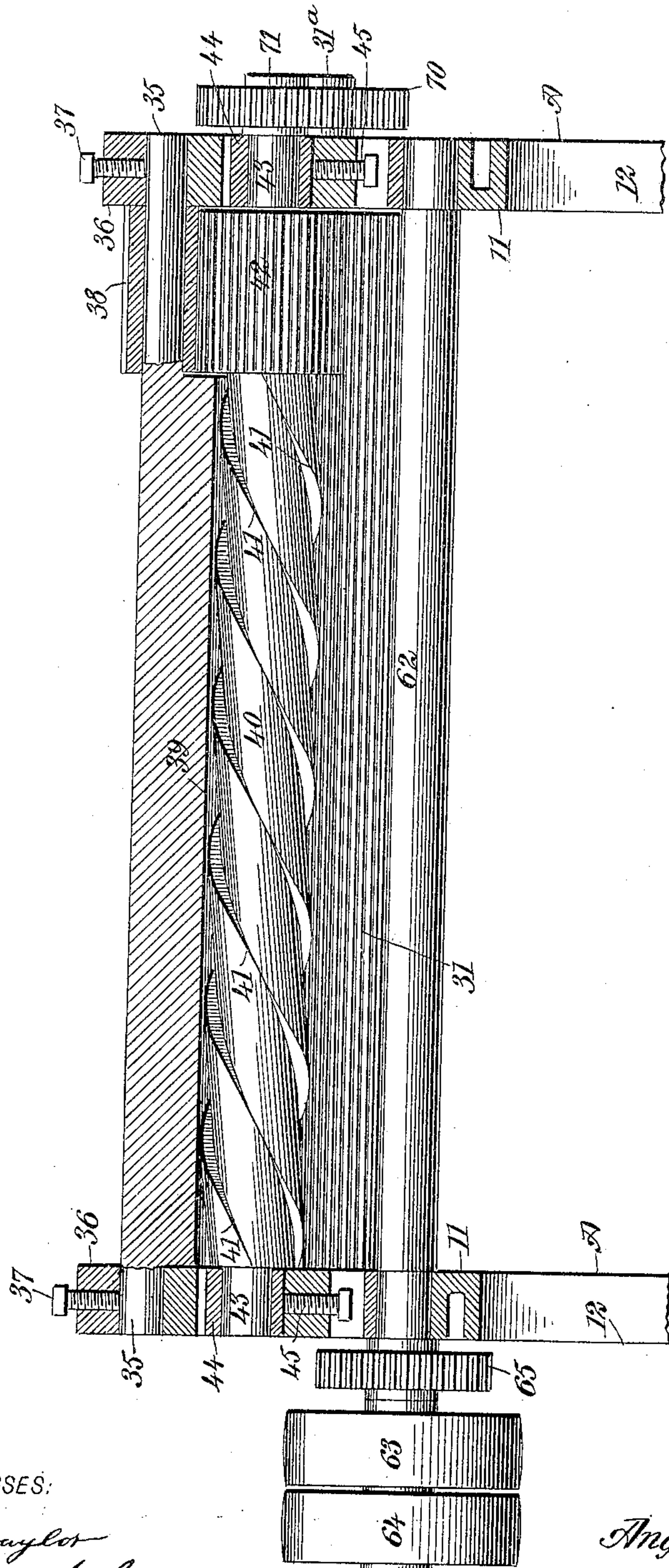
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APPLICATION FILED MAR. 10, 1903.

5 SHEETS—SHEET 4.

*Fig. 4.*



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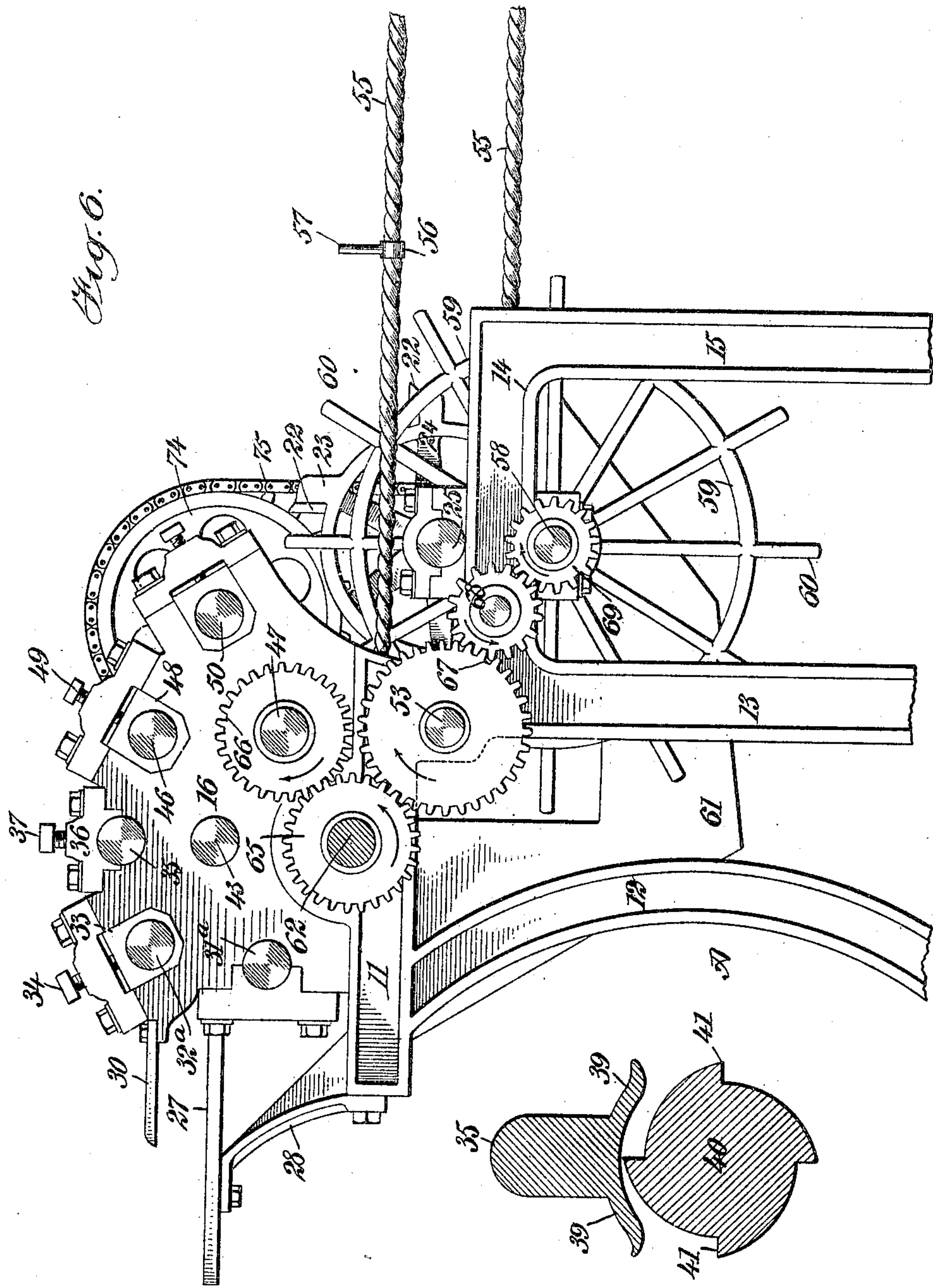


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5 SHEETS—SHEET 5.



WITNESSES:  
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Fig. 5.

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# UNITED STATES PATENT OFFICE.

ANGEL G. PONS, OF MEXICO, MEXICO.

## FIBER-CLEANING MACHINE.

No. 822,767.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed March 10, 1903. Serial No. 147,084.

*To all whom it may concern:*

Be it known that I, ANGEL G. PONS, a subject of the King of Spain, and a resident of the city of Mexico, Mexico, have invented a new and Improved Fiber-Cleaning Machine, of which the following is a full, clear, and exact description.

The purpose of my invention is to construct a machine for decorticating plants, especially sisal hemp, and to provide a machine which will expeditiously remove the pulp from the fiber in a thorough and cleanly manner and without detriment to the fiber.

A further purpose of the invention is to so construct the machine that it will be as light as possible consistent with strength and will be simple, durable, and economic and practically automatic in its action after the material has been fed thereto.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of the machine. Fig. 2 is a transverse section taken practically on the line 2 2 of Fig. 3. Fig. 3 is a plan view of the machine. Fig. 4 is a longitudinal section taken practically on the line 4 4 of Fig. 1. Fig. 5 is a transverse section through the scraper-shaft and shed, and Fig. 6 is an elevation of the right-hand side of the machine.

The frame of the machine may be of any desired formation. As shown, it consists of two side sections A, connected at their front or feeding ends by a cross-bar 10, and each side section A comprises a horizontal main beam 11, from which two legs 12 and 13 extend downward, an auxiliary horizontal beam 14 extending rearwardly and being lower than the main beam 11, which horizontal beam 14 is connected with the leg 13 and is provided at its rear end with a downwardly-extending leg 15 and a substantially segmental cheek 16, which extends upward from the main beam 11.

In addition to the foregoing the frame consists of an extension A', comprising a rear cross-bar 17, extending from the rear end of the left-hand auxiliary horizontal side beam 14 in direction of the center of the space be-

tween the side sections A and a forwardly-extending beam 18, supported by suitable legs 19 and 19<sup>a</sup> and connected with the left-hand intermediate leg 13 by a cross-bar 20. In this rear extension A' of the said frame a curved table 21 is supported, extending above and below the main horizontal left-hand beam 11 and likewise below the left-hand auxiliary side beam 14 and corresponding inner beam 18 of the said extension-frame, and this table 21 has its rear face concaved, as is particularly shown in Fig. 2. The location of this table with respect to the beams above mentioned is indicated in the plan view, Fig. 3. Knives 22 are adapted to pass over the concaved face of this table 21, and these knives 22 are secured to horizontal supports 23, attached to the peripheral portion of a wheel 24, as is shown in Figs. 2 and 3, which wheel is secured upon a shaft 25, mounted to turn in suitable bearings 26, located upon the horizontal beams 14 and 18, as is particularly shown in Fig. 3. The butts of the leaves which are not properly scraped by the initial scraper, to be hereinafter described, are here finished off or finally relieved from pulp by being fed to an engagement with the concaved face of the table 21 and being acted upon by the knives 22 through the revolution of the wheel 24.

At the forward end of the machine a feed-table 27 is supported by means of suitable brackets 28, attached, preferably, to the front cross-bar 10 of the frame, and this feed-table extends from side to side of the frame and is provided with series of apertures 29, so that when the pulp is crushed on a leaf which is fed into the machine the juice can readily escape from the said table, and above the perforated portion of the feed-table 27 a guard 30 is located, which is in the form of a board extending from side to side of the machine and attached to the cheek-pieces 16. The object of this guard is to prevent the juice when squeezed out by the mechanism to be hereinafter described from flying up in the face of the operator.

The feed-table 27 at its rear or delivery end is immediately opposite the space between two crushing-rollers 31 and 32, located one above the other, being adapted to turn in opposite directions. These crushing-rollers 31 and 32 are deeply corrugated throughout their length, as is shown in Fig. 3, and their trunnions 31<sup>a</sup> and 32<sup>a</sup> are journaled in the cheek-pieces 16 of the frame. These two



crushing-rollers mesh, as is shown in Fig. 2. The trunnions of the lower crushing-roller 31 are journaled in fixed bearings in the said cheek-pieces 16; but the trunnions 32<sup>a</sup> of the upper crushing-roller 32 are journaled in boxes 33, adjustable in suitable bearings provided in the said cheek-pieces, as is shown in Fig. 1, and these boxes are operated through the medium of set-screws 34 or their equivalents, enabling an operator to adjust the two crushing-rollers 31 and 32 as closely together or carry them as far apart as may be desired.

It may here be stated that the leaves B (indicated by dotted lines in Fig. 3) are laid with their butt-ends facing the crushing-rollers 31 and 32 on the table 27 and are so placed on the table that they occupy a diagonal position with their butt-ends facing in direction of the left-hand side portion of the machine. Many of these leaves may be laid upon the feed-table at one time, so that one after the other may be rapidly fed into the machine.

It is an object of this machine to provide a mechanism for cleaning the pulp from the body of the leaf by a rotary scraping-roller, to be hereinafter described, and then feed the cleaned fiber through the other portion of the machine between plain rollers, while the butt-end of the leaf is particularly crushed by passing through a series of corrugated rollers and is then delivered to the table 21, hereinafter mentioned and is finally cleaned by the action of the knives 22, carried by the wheel 24 over the concaved face of the said table 21.

At the upper portion of the cheek-pieces 16 of the frame to the rear of the upper crushing-roller 32 a stationary shaft 35 is carried by bearings 36, and the bearing ends of the shaft 35 are held in position by set-screws 37, passing through the bearings to an engagement with the said bearing ends. At the left-hand end of the stationary shaft 35 a pinion 38 is loosely mounted, and a horizontally-located shed 39 is made integral with this shaft or pendent from it, extending in a downward direction, the under face of said shed being more or less concaved, as shown in dotted lines in Fig. 2 and in positive lines in Fig. 5. Immediately below this shed 39 the initial scraping or cleaning shaft 40 is located, adapted to strip the pulp from the fiber of the leaf fed to the machine and as much as possible from the butt of the leaf, the stripping or scraping operation being completed by the scraping-wheel 24, acting in conjunction with the bed 21, heretofore described. This initial cleaning or scraping shaft 40 is provided with spirally-formed cutting-blades 41, (shown best in Figs. 4 and 5,) which extend from the right-hand side of the frame to within a prescribed distance of the left-hand side, as shown in Fig. 4, and at the left-hand end of this scraping or cleaning shaft 40 a gear or corrugated sleeve 42 is loosely mounted, which meshes with the pinion 38 upon the

upper stationary shaft 35. The cleaning or scraping shaft turns in an opposite direction from the crushing-roller 31, being adapted, by means of driving mechanism to be hereinafter described, to revolve to the right as viewed in Fig. 2 or toward the front or feed end of the machine, and the crushing-roller 32 turns in the same direction, while the crushing-roller 31 turns to the left as viewed in Fig. 2, or toward the discharge end of the machine, and feeds the crushed leaf to the slight space between the shed 39 and the spiral blades of the scraping-shaft 40, whereby the leaf at its upper portion has bearing against the shed, while the blades of the scraping or cleaning shaft 39 operate on the under face of a leaf to clean the pulp therefrom and expose the fiber, the leaf being reversed and passed through the machine a second time to remove the pulp from the opposite side of the leaf.

The trunnions 43 of the cleaning or scraper shaft 40 are journaled in boxes 44, provided with adjusting-screws 45; so that the cleaning or scraping shaft may be adjusted as occasion may require to and from the shed 39. At the rear of the scraper or cleaning shaft 40 upper and lower feed-shafts 46 and 47 are journaled in the cheek-pieces 16 of the frame, which feed-shafts serve to conduct the cleaned or partially-cleaned fiber of the leaf to the rear or delivery end of the machine. These feed-shafts are plain or smooth from their right-hand ends to a point near their left-hand ends, and at the latter portion of the feed-shafts 46 and 47 within the frame meshing toothed corrugated or pinion surfaces 46<sup>a</sup> and 47<sup>a</sup> are formed. The lower feed-shaft 46 is journaled in stationary bearings in the cheek-pieces 16, and the upper corresponding shaft 46 is journaled in movable boxes 48, controlled by set-screws 49, whereby one of these two shafts may be adjusted to or from the other as occasion may demand. At the extreme rear portion of the said cheek-pieces 16 a third feed-shaft 50 is mounted to turn, being also plain or smooth from its right-hand end to a point near its left-hand end, at which latter point within the frame a toothed corrugated or pinion surface 50<sup>a</sup> is provided, meshing with the corresponding surface 47<sup>a</sup> on the lower feed-shaft 47, as is shown in Fig. 2, and the journals of this third feed-shaft are journaled in movable bearings controlled by set-screws 52. These shafts 47, 46, and 50 are called "feed-shafts" principally because they carry the butts of the leaves rearward between their toothed or corrugated or pinion sections 47<sup>a</sup>, 46<sup>a</sup>, and 50<sup>a</sup> in the process of crushing and breaking the pulp at the butt of the leaf in order that the pulp may be stripped from the fiber at such butt-section by the combined action of the curved table 21 and the scraping or cleaning wheel 24. Such crushing action on the butt of the



leaves is first commenced by the crushing-rollers 31 and 32, continued by the pinions or corrugated sleeves 38 and 42, carried, respectively, by the fixed shaft 35 and scraper or cleaning shaft 40, and finished by the afore-  
 5 said toothed or corrugated sections of the feed-shafts 46, 47, and 50.

It will be observed that the pulp is removed from the body or major portion of the  
 10 leaf by the initial cleaner or scraper shaft 40 and that the fiber at the butt of the leaf, which is considerably thicker than the other portions of the leaf, may not be properly cleaned by the initial scraper. Therefore  
 15 this butt-section of the leaf is subsequently subjected to an auxiliary crushing action by the several shafts at the rear of the primary crushing-rollers, as is shown in Fig. 2, and the butt-section of the leaf is then passed  
 20 over the top portion of the curved table 21 to be finally acted upon by the scraper-wheel 24 at the rear of the machine.

Below the lower feed-shaft 47 and below the main beam 11 of the frame a shaft 53 is  
 25 journaled in suitable bearings 53<sup>b</sup>, shown extending downward from a cross-bar 53<sup>a</sup>, (see Figs. 1, 2, and 3,) and on this shaft twin peripherally-grooved pulleys 54 are secured. Over each pulley a conveyer-belt 55 is passed,  
 30 being also suitably and rotatably supported at a point distant from the machine at the place where the leaves are to be delivered. These belts are connected by a series of bridge-bars 56, one of which only is shown in  
 35 the drawings; but these bridge-bars are placed at predetermined intervals apart, and each bridge-bar is provided with a centrally-located finger 57, adapted to extend upward at the upper stretches of the belts, which fin-  
 40 gers serve to hold the cleaned leaves in transverse position upon the conveyer-belts after the leaves have left the machine and while the leaves are being taken away by the conveyers. This conveyer receives and sup-  
 45 ports the body portion of the leaves passed through the machine and initially supports the body of the leaves while their butts are receiving final treatment. After the butts of the leaves have received scraping treatment  
 50 by the scraper-wheel 24 the said sections of the leaves are drawn through the space between the two adjacent scraper-blades 22, carried by the wheel 24, in the following manner: A shaft 58 is journaled in suitable bear-  
 55 ings carried by the inner horizontal rear beam 18 of the frame and the right-hand side section thereof, and on this shaft 58, adjacent to the inner side of the rear extension A' of the main frame, a releasing-wheel 59 is secured,  
 60 having peripheral spokes 60 at desired intervals apart. The releasing-wheel 59 turns in an opposite direction from the direction of rotation of the scraping-wheel 24.

In the operation of the machine the butt of  
 65 the leaf, which being diagonally placed is al-

ways at the left-hand side of the machine as viewed in Fig. 3, will upon passing the rolls 47<sup>a</sup> and 50<sup>a</sup> fall into the space between two blades on the wheel 24 and will be taken  
 70 against and scraped upon the table 21. The leaf will now be turned over the upper end of the table 21 and extend diagonally toward the feed end of the machine, the tip and central portions of the leaf being held by the  
 75 rolls 47<sup>a</sup> and 50<sup>a</sup>. Upon the further feeding action of said rolls the portion of the leaf resting upon the upper curved portion of the table 21 will have been drawn into contact with the wheel 24 and the point of contact of the  
 80 part of the leaf stripped by the roll 40 with the bite of the rolls 47<sup>a</sup> and 50<sup>a</sup> will have shifted by reason of the diagonal position of the leaf to the right, as viewed in Fig. 3. Further progress of the leaf will bring it into  
 85 the path of the spokes 60 of the releasing-wheel, which thus engages the leaf between the portions held, respectively, between the wheel 24 and the table 21 and between the rolls 47<sup>a</sup> and 50<sup>a</sup>. Further action of the re-  
 90 leasing-wheel will draw the butt-ends of the leaves from contact with the wheel 24 and the bed 21, carrying said ends down on the left-hand side of the conveyer 55 as viewed in Fig. 3, while further action of the rolls 47<sup>a</sup>  
 95 and 50<sup>a</sup> will release the tip ends of the leaves on the right-hand side of the conveyer 55. The leaves' ends hang across the conveyer and are taken from the machine.

The receptacle 61 is especially adapted to receive the excluded moisture and pulp from  
 100 all the agencies of the machine.

This machine is preferably driven in the following manner: A drive-shaft 62 is mounted in suitable bearings upon the main beam 11  
 105 of the frame, carrying a fast and a loose pulley 63 and 64 at its right-hand end and a gear 65. This gear 65 meshes with a gear 66 at the right-hand end of the shaft 47, and a gear 67 at the same end of the shaft 53 also meshes with the gear 65 on the drive-shaft  
 110 62. The gear 67 also meshes with an idle gear 68, which in turn meshes with a gear 69 at the outer end of the shaft 58, carrying the releasing-wheel 59. At the left-hand side of the machine a gear 70 on the trunnion 31<sup>a</sup> of  
 115 the crushing-roller 31 meshes with a gear 71 on the trunnion 43 of the scraper or cleaning shaft 40, and the said gear 71 meshes with a similar gear 72 on the lower feed-shaft 47, and this latter gear in its turn meshes with  
 120 the gear 73 on the rear feed-shaft 50. The rear feed-shaft 50 also carries at its left-hand end a sprocket-wheel 74, over which a chain belt 75 is passed, which belt is also carried over a smaller sprocket-wheel 76 on the shaft  
 125 25, carrying the rear cleaning-wheel 24.

The machine requires but one operator and avoids the waste hitherto largely present in machines of this type, and as the scraping  
 130 or cleaning devices scrape or clean a leaf in



direction of the length of the fiber the fiber is cleaned from the pulp without being broken, bruised, or otherwise injured.

I desire it to be understood that the smooth portions of the several shafts 43, 46, 47, and 50 are covered with heavy canvas or a like material the purpose of which is to squeeze and clean the fiber when the fiber is brought in contact with the several shafts, and to that end the said shafts when wrapped as set forth are of such diameter that they engage to a greater or less extent, thus squeezing the cleaned fiber as it passes between them.

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

1. In a machine for cleaning fiber, crushing-rollers adapted to initially receive a leaf and to turn in opposite directions, a scraping or cleaning shaft at the rear of the crushing-rollers, receiving a leaf therefrom and turning in the same direction as one of the said crushing-rollers, a shed having a concaved upper surface, held above the scraping-shaft, a final cleaning device adapted to receive the butts of the leaves, and a releasing device for the leaves, operating in conjunction with the final cleaning device, as described.

2. In a fiber-cleaning machine, crushing-rollers having longitudinal grooves throughout their length, the said crushing-rollers being arranged to mesh, means for turning the said rollers in opposite directions, a scraping or cleaning shaft mounted to revolve at the rear of the crushing-rollers, opposite their point of contact, the said scraping-shaft being provided with spirally-formed scraping-blades, a shed held above the scraping-shaft, means for turning the scraping-shaft in the opposite direction from the direction of rotation of one of the crushing-rollers, a feed-table adapted to direct the leaves to the crushing-rollers, the said feed-table having apertures for the escape of juice, a guard located above the apertured portion of the feed-table, an auxiliary scraping-wheel at the rear of the machine, a curved table adjacent to said scraping-wheel, a releasing-wheel having peripheral spokes, which wheel is adapted to revolve in an opposite direction to the scraping-wheel, and a conveyer which receives material from the auxiliary scraping device, as described.

3. In a fiber-cleaning machine, initial crushing-rollers, a scraping or cleaning shaft located at the rear of the said crushing-rollers opposite their point of contact, a shed over the scraping-shaft, feed-shafts located at the rear of the said scraping or cleaning shaft, the said feed-shafts being covered with an elastic material such as canvas for a portion of their length, a conveyer at the rear of the feed-shafts, adapted to receive the cleaned leaves, and an auxiliary cleaning device adapted to finally act upon the butt por-

tions of the leaves when leaving the feed-shafts, as described.

4. In a fiber-cleaning machine, initial crushing-rollers, a scraping and cleaning shaft located at the rear of the said crushing-rollers opposite their point of contact, a shed over the scraping-shaft, feed-shafts located at the rear of the said scraping and cleaning shaft, the said feed-shafts being covered with an elastic squeezing material such as canvas for a portion of their length, a conveyer at the rear of the feed-shafts, adapted to receive the body portions of the cleaned leaves, an auxiliary cleaning device adapted to finally act upon the butt portions of the leaves when leaving the feed-shafts, and a releasing-wheel provided with peripheral spokes, the spokes of the said wheel being adapted to engage with the cleaned or partially-cleaned leaves and withdraw their butt portions from engagement with the auxiliary cleaning device, as set forth.

5. In a machine for cleaning fiber, a cleaning device consisting of a curved table, a wheel adapted to revolve concentrically with reference to the said table, scraper-blades carried by the said wheel, adapted to move in near relation to the concaved surface of the said table, and a releasing-wheel mounted to revolve adjacent to the scraper-wheel, the releasing-wheel being provided with peripheral offsets adapted for engagement with the leaf being treated and to withdraw the said leaf at proper time from the said cleaning device, as described.

6. In a fiber-cleaning machine, the combination with initial crushing-rollers, said rollers having longitudinal grooves throughout their length and arranged to mesh, a scraping and cleaning shaft at the rear of the said crushing-rollers, provided with spirally-arranged cutters, a shed above the said shaft, feed-shafts located at the rear of the said scraping and cleaning shaft, and corrugated or toothed surfaces located at corresponding ends of the said scraping and cleaning shaft and the said feed-shafts, adapted to receive the butts of the leaves, as and for the purpose described.

7. In a fiber-cleaning machine, the combination with initial crushing-rollers, the said rollers having longitudinal grooves throughout their length and arranged to mesh, a scraping and cleaning shaft at the rear of the said crushing-rollers, provided with spirally-arranged cutters, a shed above said shaft, feed-shafts located at the rear of the said scraping and cleaning shaft, corrugated or toothed surfaces located at corresponding ends of the said cleaning and scraping shaft and the said feed-shafts, adapted to receive the butts of the leaves, an auxiliary cleaning device for the butts of the leaves, comprising a curved table, a scraping-wheel the scraper-blades of which are mounted to move in close proximity



to the concaved surface of the said table, a releasing-wheel for the fiber, operating in conjunction with the said auxiliary scraping device, and a conveying mechanism for the  
5 cleaned or partially-cleaned leaves, as set forth.

8. In a fiber-cleaning machine, an initial scraper or cleaning shaft provided with spirally-arranged cutters, and a shed located  
10 above the said cutters, having its under face or surface opposite to the said scraping and cleaning shaft concaved, means for adjusting the said shed to and from the said scraping and cleaning shaft, and crushing-rollers  
15 mounted to revolve in front of the said scraping and cleaning shaft, corrugated longitudinally throughout their length, the said crushing-rollers being adapted to mesh, and a driving mechanism substantially as described, for  
20 turning the crushing-rollers in a rearward direction and simultaneously turning the scraping and feed shafts in a forward direction, for the purposes described.

9. In a machine for cleaning fiber, longitudinally-grooved pulleys, supports for the pulleys, and a conveyer consisting of endless belts passed over the said pulleys in determined parallel relation to each other, bridge-bars connecting the said belts, and fingers  
25 extending outwardly from the bridge-bars, for the purpose described.  
30

10. In a machine for cleaning fiber, the combination with a series of crushing-rollers, an initial scraping-shaft having longitudinal cutters thereon, and feed-rollers at the rear  
35 of the scraping-shaft, of peripherally-grooved pulleys, supports for the said pulleys at the rear and below the said feed-rollers, a conveyer consisting of endless belts passed over the said pulleys in determined parallel rela-  
40 tions to each other, bridge-bars connecting the said belts, fingers extending outwardly from the said bridge-bars, a rearwardly-curved table extending down below the lower rear feed-roller, an auxiliary scraping-wheel  
45 having peripheral scrapers adapted to travel in near proximity to the concaved surface of the said table, and a releasing-wheel mounted to revolve between the scraping-wheel and the conveyer, the two wheels being adapted  
50 to revolve in opposite directions and the scraping-wheel being provided with peripheral spokes which are opposite the spaces between the scrapers on the scraping-wheels, as and for the purpose described.  
55

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

ANGEL G. PONS.

Witnesses:

CARL J. SCHRAMM,  
A. V. RINNEY.