

No. 755,931.

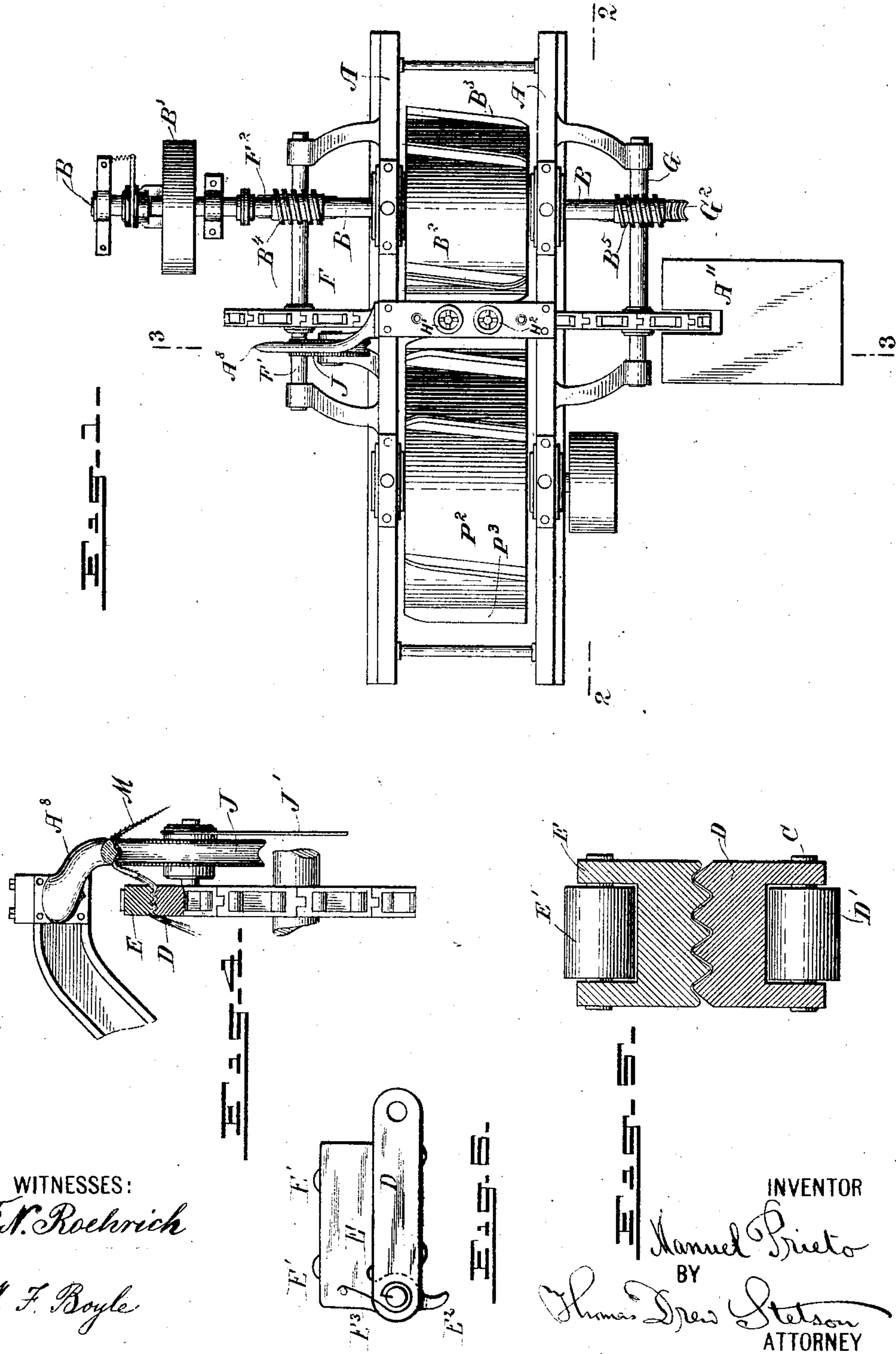
PATENTED MAR. 29, 1904.

M. PRIETO.  
MACHINE FOR DISINTEGRATING FIBROUS PLANTS.

APPLICATION FILED OCT. 7, 1901.

NO. MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

*F. N. Roehrich*

*M. F. Boyle*

INVENTOR

*Manuel Prieto*

BY

*Thomas Drew Stetson*  
ATTORNEY

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2 SHEETS—SHEET 2.

Fig. 2

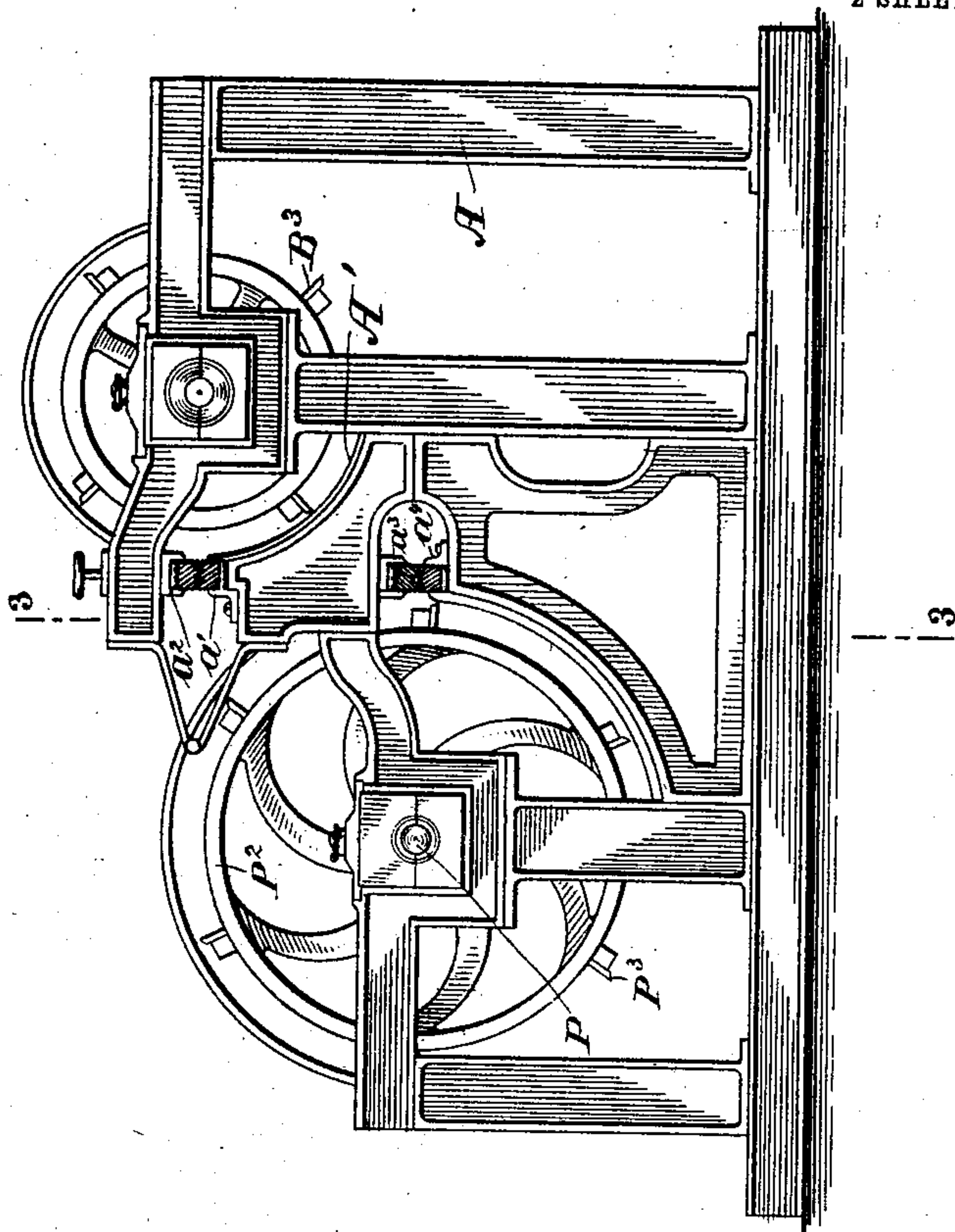
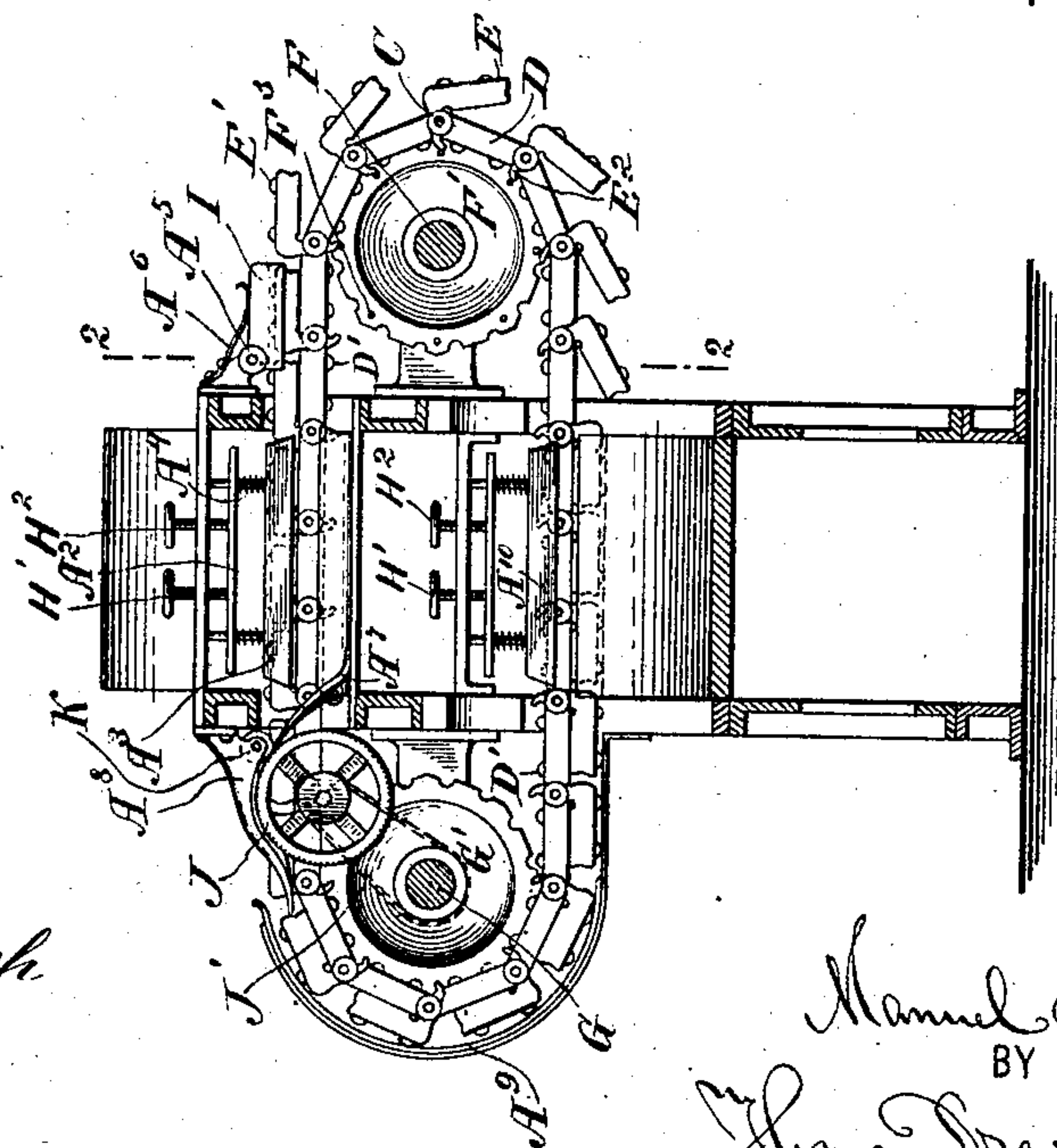


Fig. 3



WITNESSES:  
*F. N. Rockrich*  
*M. F. Boyle*

INVENTOR  
*Manuel Prieto*  
BY  
*James Drew Stetson*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

MANUEL PRIETO, OF MEXICO, MEXICO.

## MACHINE FOR DISINTEGRATING FIBROUS PLANTS.

SPECIFICATION forming part of Letters Patent No. 755,931, dated March 29, 1904.

Application filed October 7, 1901. Serial No. 77,826. (No model.)

*To all whom it may concern:*

Be it known that I, MANUEL PRIETO, a citizen of the Republic of Mexico, residing in the city of Mexico, in the Republic of Mexico, have invented a certain new and useful Improvement in Machines for Disintegrating Fibrous Plants, of which the following is a specification.

The machine resembles in some respects that set forth in the United States patent to my brother, Demetrio Prieto, dated May 29, 1883, No. 278,668, in which the leaves are treated successively by beaters on two beating-drums, one for each end of the leaf. I have devised a construction in which one endless traveling leaf-carrier serves to present the leaves to both sets of beaters, the beaters being arranged on opposite sides of the said carrier. I have also devised other improvements, as hereinafter set forth.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a general plan view showing the whole. Fig. 2 is a front elevation with the leaf-carrier in section on line 2 2, Figs. 1 and 3, the pulley of shaft P, the worm-wheel of shaft B, the shaft G, the wheel G<sup>2</sup>, the supporting-brackets of shaft G, and the table A<sup>11</sup> being omitted. Fig. 3 is a section on the line 3 3 in Figs. 1 and 2. Fig. 4 represents a portion detached. It is an elevation on a larger scale, seen in the direction opposite to the view in Fig. 2. Fig. 5 shows a detail on a still larger scale. It is a cross-section of the chain and clamp. Fig. 6 is a detached view of one of the parts, showing a certain spring which exerts a gentle force to relax the grip of the clamp.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is the framing, of cast-iron or other suitable material.

B is a stout shaft carried in boxes in the framing and rotated strongly and rapidly by any suitable means, as by a belt running on a pulley B<sup>1</sup>.

B<sup>2</sup> is a drum keyed on the shaft B and carrying scrapers or beaters B<sup>3</sup>, which perform an important function in scraping and cleaning one end of each leaf as it is carried by between the beaters and a smooth curved bed A'. The leaves are engaged between clamps E and short lengths or links D, which latter by the aid of loose rivets C, connecting them flexibly together, constitute a strong endless chain, which rising from below runs over a wheel F', mounted on a shaft F. This latter is driven by a worm-wheel F<sup>2</sup>, which is engaged by a worm B<sup>4</sup> on the shaft B. I use a corresponding shaft G, having corresponding wheels G' G<sup>2</sup> and similarly engaged by a worm B<sup>5</sup> on the same shaft B. These wheels F' G' carry the chain of links D and pivots C with its clamps E. The attendant introduces the several leaves M successively, allowing them to be gripped in turn by the clamps E and carried slowly into the machine by the motion of the chain. The chain is supported in a straight way or channel a' and equipped with rollers D' on the inner face of each link D. The clamps E also traverse in a channel or way a<sup>2</sup>. They are similarly equipped with rollers E' on their outer faces. These rollers reduce the friction under the strong pressure received while they are presenting their leaves successively to the action of the beaters B<sup>3</sup>. I make the pressure on the leaves in this portion of their traverse through the machine very slightly elastic by the aid of a strong platen A<sup>3</sup>, supported in the framing and capable of rising and sinking under the influence of springs A<sup>4</sup>, which are acted on by a plate A<sup>2</sup>, subject to an adjustable pressure from screws H' H<sup>2</sup>, having operating hand-wheels. On the first introduction of each leaf it is subject only to gentle compression between its link D of the chain and the corresponding clamp E. The pressure at this stage is a yielding one, imparted through a hinged piece I, pivoted at A<sup>5</sup> and subject to the force of a gentle compressing-spring A<sup>6</sup>. In subsequently passing under the strongly-held and only slightly-yielding adjustable platen A<sup>3</sup> the clamps are caused to take very firm hold on the several leaves, and they are able to resist the pull due to the scraping action of the beaters B<sup>3</sup>.



After they have been thus carried across the path of the beaters  $B^3$ , which scrape somewhat more than one-half of each leaf, the pressure of the clamps  $E$  is again relaxed for a period and then again tightened. During this relaxation of the pressure each leaf is pulled endwise. The clamp  $E$  after such shifting being again gently compressed, its grip now takes hold only on the fiber which has been cleaned. When thus held in the new position, the whole of the untreated portion of each leaf will project on the left side in Figs. 1 and 2. This shifting of each leaf endwise relatively to itself and laterally relatively to the motion of the chain is effected by gripping the untreated portion of the leaf and carrying it upward to a sufficient extent out of the path of the chain. This motion draws the liberated leaf through the chain to a sufficient extent. It is attained as follows:

$A^7$  is a fixture which I will term the "lifter," attached by bolting to the framing  $A$  and extending upward at an inclination beyond the path of the untreated ends of the several leaves. The form and arrangement cause it to engage with each leaf and deflect it upward.

$J$  is a wheel which I will term the "lifting-wheel." It turns on an axis parallel to the axes of the chain-wheels  $F'$  and  $G'$ , but at so much higher level that although it is a smaller wheel its upper portion is considerably above the chain. The arrangement is shown in Figs. 3 and 4. This is rotated by a belt  $J'$ , so that its surface traverses at a faster rate than the chain.

$A^8$  is a sufficiently strong piece which I will term a "holder," bolted on the framing at a higher point and extending downward and rearward over the lifting-wheel  $J$ . Its lower edge is finished with a curvature to exactly correspond with the periphery of the wheel and is nicely polished.

The leaf is pulled by its untreated end being gripped between the revolving wheel  $J$  and the stationary holder  $A^8$ . The grip of the wheel and holder is promoted by a mashing of the leaf across the part which is to be seized, this being effected by the aid of a small wheel  $K$ , carried in the holder and allowed to turn freely. It is shown clearly in Fig. 3. It will now be seen that each leaf immediately after its treatment by the beaters  $B^3$  is temporarily released by its carrier in consequence of the liberation of the clamp  $E$  and its untreated portion is lifted, seized, and mashed by the wheels  $J$  and  $K$ , and thus carried rearward in a curved path between the wheel  $J$  and the holder  $A^8$ , which path is so much above the straight horizontal path of the corresponding portion of the chain that it draws the leaf endwise to a sufficient distance. After the summit of the lifting-wheel  $J$  has been passed the leaf is allowed to descend again and is released, hanging from the chain and clamp more or less limp. Next

the clamp  $E$ , which holds this leaf, at this stage is again pressed against the corresponding link of the chain and gently and somewhat tightly takes hold of the leaf, or rather of the cleaned fibers in the half which has been already treated. In this condition it is ready to be presented to the second beating-drum  $P^2$ . This second beating-drum is carried on a shaft  $P$ , supported in the same framing  $A$ , but at a lower level than the shaft  $B$ . It is on the left side of the chain. (See Figs. 1 and 2.) The chain reverses its motion by passing over the chain-wheel  $G'$ , the clamps  $E$  being tightly closed and held closed by a sufficiently stout casing  $A^9$ . (See Fig. 3.) The grip of the clamp is strongly reinforced in passing the second drum  $P^2$  by means of a strong platen  $A^{10}$ , with provisions by screws and springs for holding it strongly but slightly yieldingly down. In this forward traverse of the leaf the chain and clamps move, as in the previous traverse, through channels  $a^3$   $a^4$ , provided in the framing. The cleaning of the previously-untreated portion, which is now presented, is effected by beaters  $P^3$ . After a leaf has passed these second beaters the clamp  $E$ , which holds it, is entirely released and drops by gravity into the inclined position shown on the lower right-hand side in Fig. 3. Thus released the now completely-cleaned fiber will fall out by gravity or can be easily removed by hand or by automatic clearers, or both. As the chain passes half around the chain-wheel  $F'$  in its rising motion the clamps are held open by contact of a horn  $E^2$  on each with a pin  $F^3$  on the wheel  $F'$ . (See Fig. 3.) This holds the clamp open until it has reached and passed the highest point in the wheel  $F'$ . During the last portion of its remaining open the attendant supplies a fresh leaf from a table  $A^{11}$ , (see Fig. 1,) immediately after which the clamp  $E$  is released from its contact with the corresponding pin  $F^3$  and being depressed by the hinged platen  $I$  is closed. The gentle holding thus commenced becomes greatly strengthened as it passes under the stout platen  $A^3$ , and the round of operations previously described is again resumed, and so on indefinitely.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention. There may be a second belt (not shown) running on a pulley on the shaft  $P$  of the lower drum, or there may be other means, as gearing from the shaft  $B$ , to drive that shaft. Other means than the gently-depressed piece  $I$  may be employed for initiating the grip of the clamps and chain. It is only necessary that it shall be such as may properly crush the tough leaf without meeting such resistance as shall displace the leaf. Other means than the screws  $H'$   $H^2$  may be employed for strongly depressing the platen  $A^3$  or  $A^{10}$ , and thus forcibly clamping the leaves at the required points. Means, as



a spring acting on each clamp E, may increase the relaxation of the grip of the clamp and chain when traversing the portion of the path in which the leaves are to be shifted laterally in the chain. Such a spring is indicated at E<sup>3</sup> in Fig. 6. The curved portion of the under side of the fixed holder A<sup>8</sup> may be made to apply to the wheel J nearer than shown to the side which receives the leaves and may terminate exactly at the highest point on the wheel. Such may be determined by trial and may require slight changes to adapt the machine to treat plants of different species. It is important to so adjust the details as to insure an early grasp of the leaves by the pulling device and a prompt and complete cessation of its influence without ever pushing the leaf partially back again.

I claim as my invention—

1. In a machine for treating fibrous plants, means for holding and carrying forward such plants or portions thereof, means for beating and scraping one half, provisions for temporarily relaxing the grip of the holding and carrying means, and for automatically shifting the leaf endwise during such periods, provisions for again tightening the grip of the same holding and carrying means while keeping the leaf extended practically straight, and means, arranged on the opposite sides of the holding and carrying means, for beating and scraping the remainder of the leaf, all combined and arranged to serve substantially as herein specified.

2. In a machine for treating fibrous plants, two revolving drums with beaters arranged at different levels on opposite sides of the carrying-chain and a single endless carrying-chain D and clamps E pivoted to the latter arranged to hold and carry the leaves and present the ends respectively to each beater in combination with each other and with the lifter A<sup>7</sup>, pulling-wheel J and stationary holder A<sup>8</sup> arranged adjacent to the chain adapted for seizing the untreated portion of the leaf and shifting it laterally in the chain substantially as herein specified.

3. In a machine for treating fibrous plants, two revolving drums with beaters arranged at different levels on opposite sides of the carrying-chain and a single endless carrying-chain D and clamps E pivoted to the latter arranged to hold and carry the leaves and present the ends respectively to each beater, in combination with each other and with the lifter A<sup>7</sup>, pulling-wheel J and stationary holder A<sup>8</sup> arranged adjacent to the chain adapted for seizing the untreated portion of the leaf and shifting it laterally in the chain, and also with the mashing-wheel K mounted in such holder arranged to press the leaf on such wheel J, all substantially as herein specified.

4. In a machine for treating fibrous plants, two revolving drums with beaters arranged at different levels on opposite sides of the ma-

chine, and a single endless carrying-chain and clamps E pivoted thereto arranged to hold and carry the leaves and present the ends respectively to each, in combination with each other and with the lifter A<sup>7</sup>, pulling-wheel J and stationary holder A<sup>8</sup>, arranged adjacent to the chain, adapted for seizing the untreated portion of the leaf and shifting it laterally in the chain, all substantially as herein specified.

5. In a machine for treating fibrous plants, two revolving drums with beaters arranged at different levels on opposite sides of the machine, and a single carrying-chain and clamps E pivoted thereto arranged to hold and carry the leaves and present the ends respectively to each, in combination with each other and with the lifter A<sup>7</sup> pulling-wheel J, stationary holder A<sup>8</sup> arranged adjacent thereto adapted for seizing the untreated portion of the leaf and shifting it laterally in the chain, and with the mashing-wheel K mounted in such holder pressing the leaf on such wheel J, all arranged to serve substantially as herein specified.

6. The combination with two sets of beating or scraping means, and an endless traveling leaf-carrier in the form of a chain which travels around chain-wheels, of devices distinct from said chain for grasping the untreated ends of leaves and pulling them endwise, said devices including the wheel K, and the wheel J mounted on separate shafts parallel with and adjacent to the shaft of a chain-wheel and belted to the latter shaft and the holder A<sup>8</sup>, the two sets of beating or scraping means being arranged to act one set on the leaves while traveling to the left and the other set on them while traveling to the right, substantially as described.

7. The combination with an endless traveling leaf-carrier moving in a vertical plane, of a drum or beater having its axis in the same horizontal plane as the upper member of said carrier, and a second drum having its axis in the same horizontal plane as the lower member and on the opposite side of said carrier, substantially as described.

8. The combination with an endless traveling leaf-carrier in the form of a chain moving in a vertical plane around chain-wheels, of a drum or beater having its axis in the same horizontal plane as the upper member of said carrier, devices distinct from said chain for grasping the untreated ends of leaves and pulling them endwise, said devices comprising a wheel mounted on a shaft parallel with and adjacent to the shaft of a chain-wheel and belted to the latter shaft, and a second drum arranged on the opposite side of said chain and having its axis in the same horizontal plane as the lower member of said carrier, substantially as described.

9. The combination with the endless traveling leaf-carrier composed of clamps, and two sets of beating or scraping means, of the plat-



ens for holding the several clamps closed while they are respectively passing each set of beating or scraping means, and a concave A<sup>9</sup> for keeping them from opening in their intermediate position, substantially as described.

10 10. The combination of two drums or beaters, an endless leaf-carrier provided with clamps, two platens for holding the clamps closed while passing said drums or beaters, devices for moving the leaves endwise in their carrier intermediate said platens, and a concave A<sup>9</sup> also intermediate said platens, substantially as described.

15 11. The combination of two drums or beaters, an endless leaf-carrier provided with clamps, two platens for holding the clamps closed while passing said drums or beaters, devices for moving the leaves endwise in their carrier intermediate said platens, and pins for temporarily holding open said clamps by con-

tact therewith before they pass the first drum or beater, substantially as described.

12. The combination of two drums or beaters, an endless leaf-carrier provided with clamps, two platens for holding the clamps closed while passing said drums or beaters, devices for moving the leaves endwise in their carrier intermediate said platens, a concave also intermediate said platens, and pins for temporarily holding open said clamps by contact therewith before they pass the first drum or beater, substantially as described.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

MANUEL PRIETO.

Witnesses:

STE. YURAZ,  
MIGUEL S. CASTRO.