(Model.)

2 Sheets—Sheet 1.

H. B. STEVENS.

SUGAR CANE MILL.

No. 270,502. Patented Jan. 9, 1883.

Fig. 1.

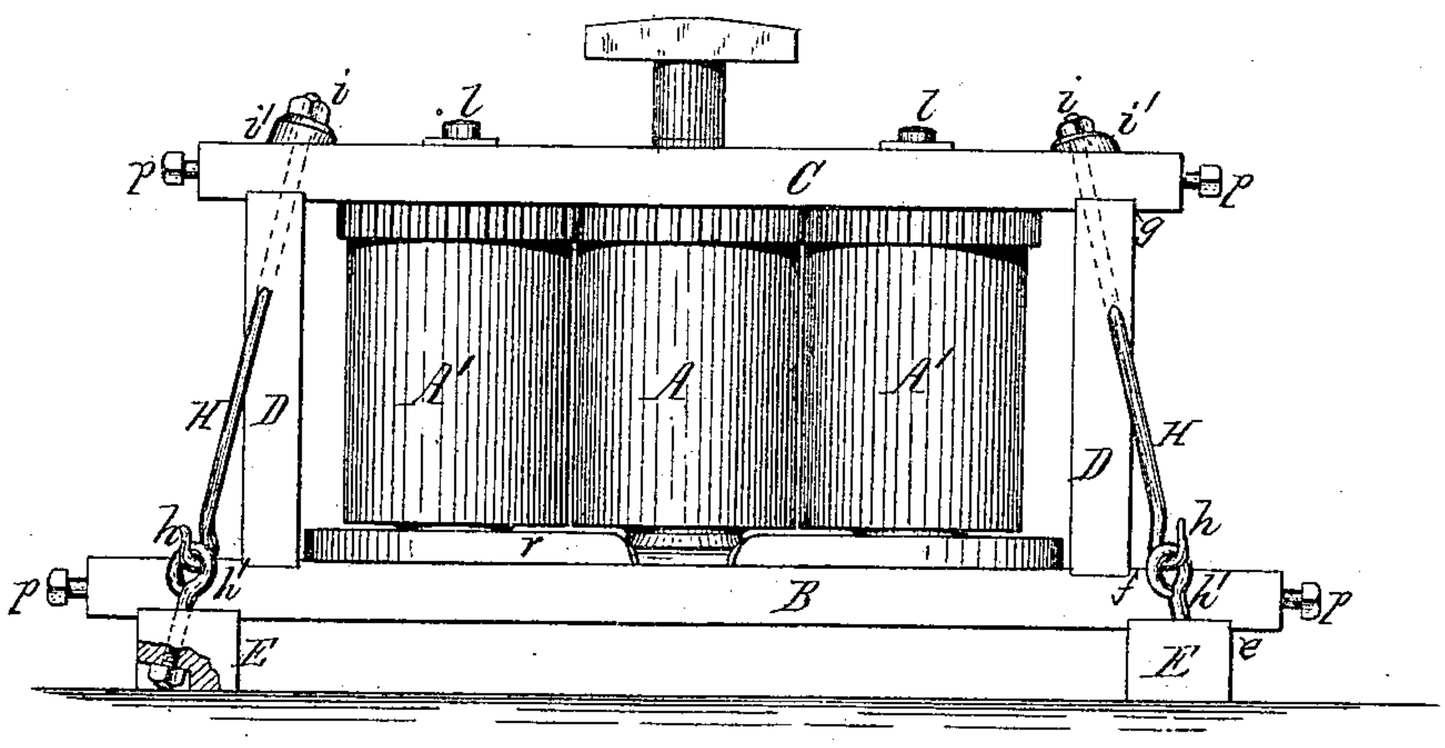


Fig. 2.

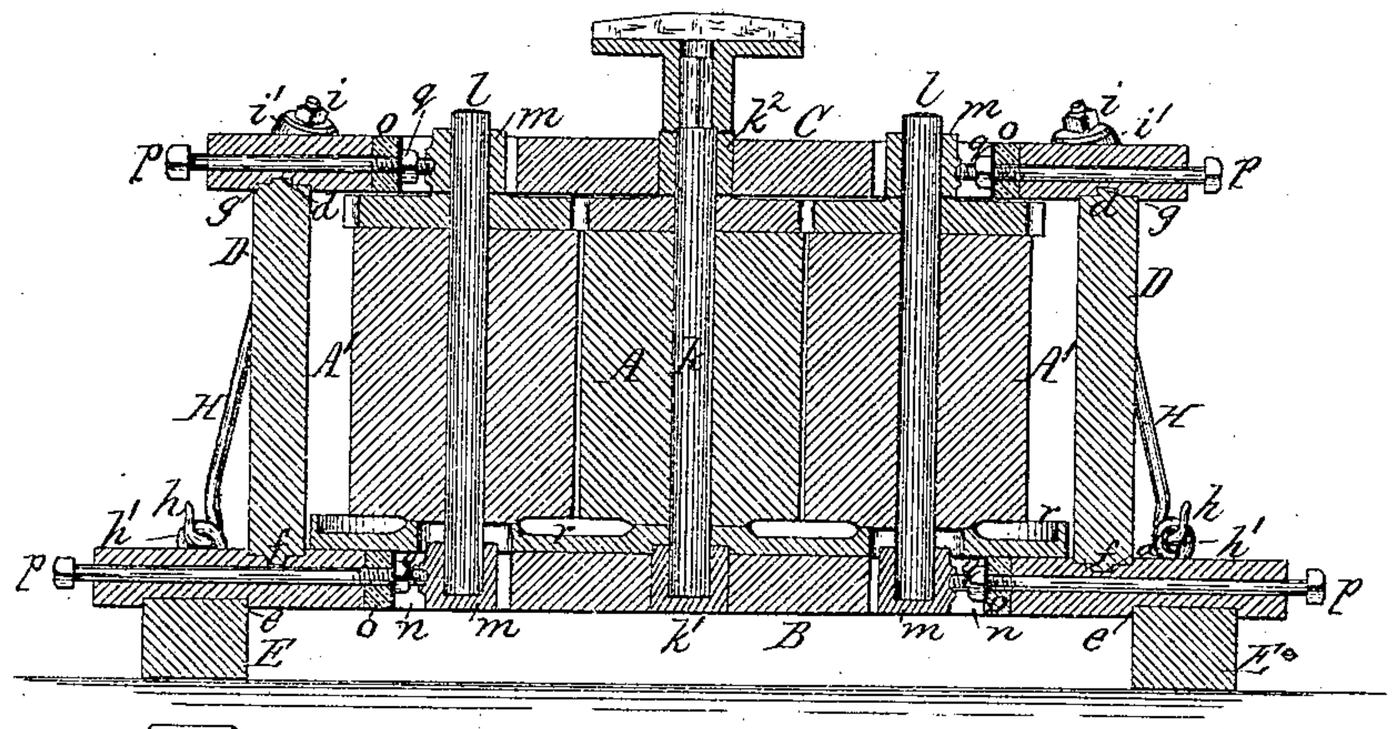
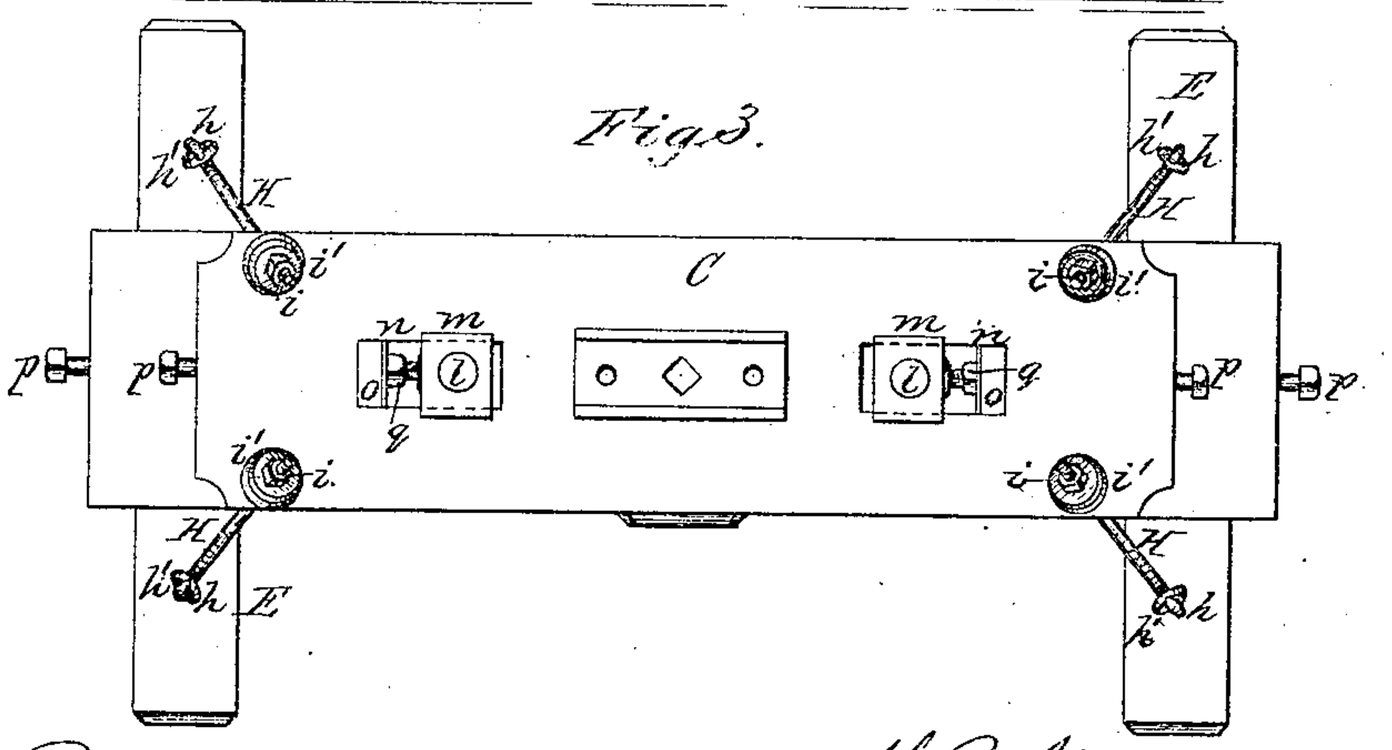


Fig. 3.



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(Model.) 2 Sheets—Sheet 2.

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SUGAR CANE MILL.

No. 270,502. Patented Jan. 9, 1883.

Fig. 4.

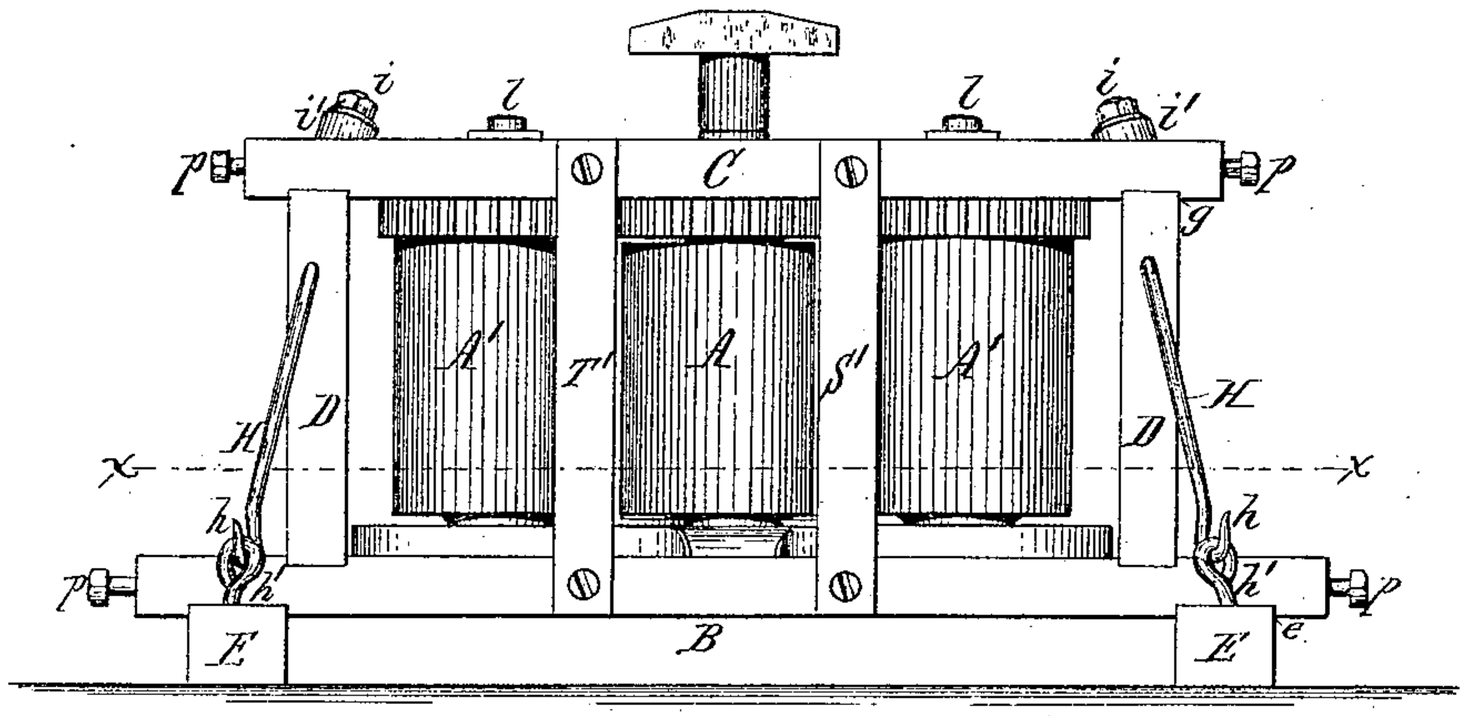


Fig. 5.

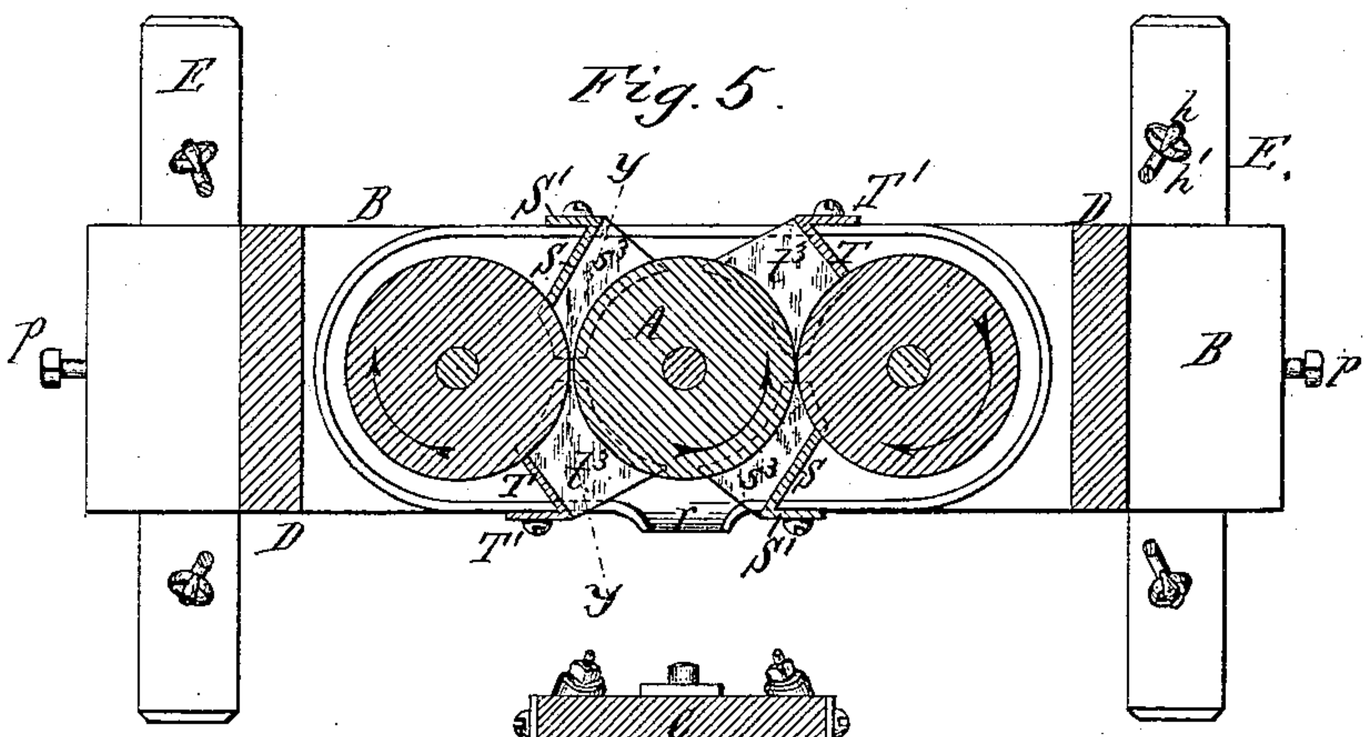
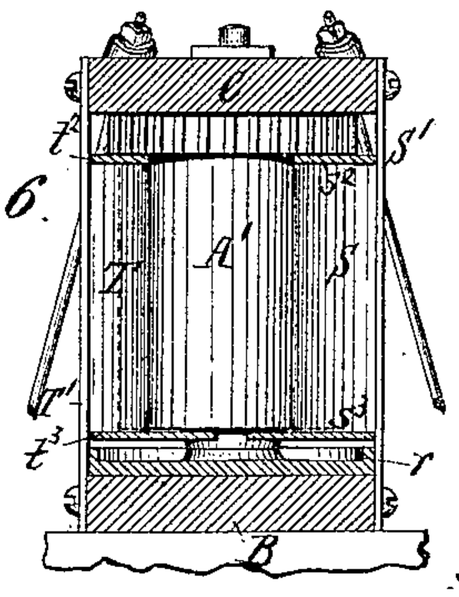


Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY B. STEVENS, OF BUFFALO, NEW YORK, ASSIGNOR TO GEORGE L. SQUIER, OF SAME PLACE.

SUGAR-CANE MILL.

SPECIFICATION forming part of Letters Patent No. 270,502, dated January 9, 1883.

Application filed March 6, 1880. (Model.)

To all whom it may concern:

Be it known that I, HENRY B. STEVENS, of the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Sugar-Cane Mills, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates more particularly to that class of cane-mills which are provided with two or three rollers arranged vertically. This class of cane-mills is very extensively used in cane-growing countries, and these mills are mostly constructed in a primitive and unskillful manner.

The object of my invention is to render this class of cane-mills more durable in construction and more efficient and convenient in their operation.

My invention consists, to that end, of the improvements which are hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is an elevation of my improved cane-mill with the guide-plates removed. Fig. 2 is a longitudinal section thereof. Fig. 3 is a top plan view, and Fig. 4 an elevation, of my improved machine. Fig. 5 is a horizontal section in line *x x*, Fig. 4; Fig. 6, a cross-section, line *y y*, Fig. 5.

Like letters of reference designate like parts in the several figures.

A A′ represent the crushing-rollers, arranged vertically in the frame-work, A being the central driving-roller and A′ A′ the driven rollers, arranged on opposite sides of the driving-roller in a straight line, the rollers being connected by gearing at the top in the usual manner.

B represents the bed-piece of the frame-work, C the top piece, D D the upright end pieces, and E E the cross-sills, all composed of timbers of suitable size. The bed-piece B is notched on its under side for the reception of the sills E, which latter are also notched to form a lock-joint, as shown at *e*. The bed-piece B is also notched on its upper side, as shown at *f*, for the reception of the lower ends of the uprights D. The top piece, C, is notched on its under side, as shown at *g*, for the reception of the upper ends of the uprights D. In this manner the several timbers of which the frame is composed are firmly locked together. The uprights D may be provided at their ends with dowel-pins *d* entering openings in the top and bed pieces, whereby the lateral displacement of the members of the frame is prevented.

H are tie-rods, arranged obliquely at each corner of the frame, and having their lower ends bent in the form of hooks *h*, which engage in eyes *h′*, secured to the sills E. The upper portion of each tie-rod H penetrates in an oblique direction the upper portion of the upright D and the top piece, C, and is provided above the latter with a screw-nut, *i*, and washer *i′*. By tightening the nuts *i* the different parts of the frame are firmly drawn together, so as to form a rigid, solid frame-work, the stability of which is greatly increased by the oblique position of the tie-rods.

k is the shaft of the central driving-roll, which turns in fixed bearings *k′ k²*, secured respectively to the bed-piece B and top piece, C.

l l are the shafts of the driven rolls, turning in bearings *m*, which are made movable in slots or ways *n*, formed in the bed-piece B and top piece, C, in such manner that the driven-rolls can move toward and from the driving-roll A.

o is a spring, of india-rubber or other suitable material, arranged in each slot *n*, so as to bear against the outer end thereof, the bearing *m* being arranged near the inner end of the slot. *p* is a set-screw passing longitudinally through each slot *n* and loosely through the timber in which the slot is formed, and provided on the outer side of the timber with a head or other suitable device for turning the set-screw by means of a suitable wrench. The inner end of the set-screw passes through the spring *o* and bears against the bearing *m*, and is provided with a screw-nut, *q*, bearing against the spring *o*. When the cane is introduced between the fixed roller A and the movable roller A′ the latter yields to a certain extent, the screw-nuts *q* compressing the springs *o* until the pressure is relieved, when the reaction of the springs *o* returns the movable roller to its former position. In this manner the driven rollers A′ are rendered self-adjusting, whereby they are enabled to accommodate themselves to the unequal feeding of the cane, and effect the crushing of the cane more uniformly and

thoroughly. The draft of the machine is also rendered easier by making the rollers self-adjusting, as the jerking motion which is found in machines having rigid rollers is entirely obviated in my improved machine. By turning the set-screw *p* in one or the other direction the spring *o* is released or compressed, and the pressure applied to the movable roller regulated accordingly.

r is a shallow pan or flanged plate, arranged upon the bed-piece B, below the rollers, in a common manner for the reception of the cane-juice.

S is a vertical guide-plate, arranged on each feeding side of the central driving-roller A, nearly parallel with that portion of the circumference of the driving-roller which lies next the driven roller, so as to form a channel between the driving-roller and the guide-plate S, whereby the cane is fed between the rollers at an angle. The plate S may be either straight, as shown in the drawings, or curved concentric with the driving-roller.

S′ is a vertical guard plate or bar, to which the outer edge of the guide-plate S is secured, and which is attached with its upper and lower ends to the top and bottom pieces, B and C, of the frame-work. The guard-plate S′ is arranged directly in front of the opening between the driving-roller and the driven roller, so as to cover this opening and prevent the attendant from having his hand caught between the rollers.

s^2 is a horizontal flange, arranged at the upper end of each guide-plate S, below the gear-wheels of the roller, so as to close the space between the rollers and the guide-plate S and prevent the cane from getting into the gearing.

s^3 is a similar horizontal flange, secured to the lower end of the guide-plate S, above the juice-pan *r*, for preventing the cane from getting into the pan.

T is a vertical scraper-plate, arranged on the discharge side of each driven roller to scrape the bagasse from the surface of the roller. The scraper-plates T are secured to vertical bars or plates T′, which are attached to the top and bottom pieces, B and C, of the frame-work.

t^2 and t^3 are horizontal flanges, arranged respectively at the upper and lower ends of the scraper-plates, below the gearing and above the juice-pan, for preventing the bagasse from getting into the gearing and the juice-pan.

The guide-plates S compel the attendants to feed the cane between the rollers at an angle corresponding with that of the guide-plates, whereby the cane is partly wrapped around the central driving-roller. This enables the rollers to draw the cane between the rollers much easier than when the cane is fed in the usual manner tangentially with the rollers.

I claim as my invention—

1. The combination, with the adjustable crushing-roller, of the bearings *m*, sliding in ways *n*, the set-screws *p*, passing loosely through the stationary frame, the springs *o*, arranged on the set-screws *p*, between the ways *n* and the screw-nuts *q*, applied to the set-screws *p*, on the inner side of the springs *o*, substantially as set forth.

2. The combination, with the rollers A A′, of the vertical guard-plate S′, secured to the horizontal pieces B C of the frame, and arranged directly in front of the opening between the two rollers, whereby the opening is covered and the cane prevented from being fed between the rollers in a tangential line, substantially as set forth.

3. The combination, with the driving-roller A and driven roller A′, of the vertical guide-plate S, arranged opposite the feeding side of the driving-roller with its inner edge toward the face of the driven roller, whereby the cane is fed against the face of the driven roller and pressed against the feeding side of the driving-roller and partly wrapped around the latter in feeding, substantially as set forth.

4. The combination, with the driving-roller A and driven roller A′, of the vertical guide-plate S, arranged opposite the feeding side of the driving-roller, with its inner edge toward the face of the driven roller, and the vertical guard-plate S′, secured to the outer edge of the guide-plate S in a line with the opening between the rollers, substantially as set forth.

5. The combination, with the driving-roller A and driven roller A′, of the vertical guide-plate S, arranged opposite the feeding side of the driving-roller, with its inner edge toward the face of the driven roller, and the vertical scraper-plate T, arranged opposite the discharge side of the driving-roller and bearing with its inner edge against the face of the driven roller, substantially as set forth.

6. The combination, with the driving-roller A and driven roller A′, of the vertical guide-plate S, arranged opposite the feeding side of the driving-roller, with its inner edge toward the face of the driven roller, the vertical guard-plate S′, secured to the outer edge of the guide-plate S in a line with the opening between the rollers, and the vertical scraper-plate T, arranged opposite the discharge sides of the driving-roller, and bearing with its inner edge against the face of the driven roller, substantially as set forth.

H. B. STEVENS.

Witnesses:
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