

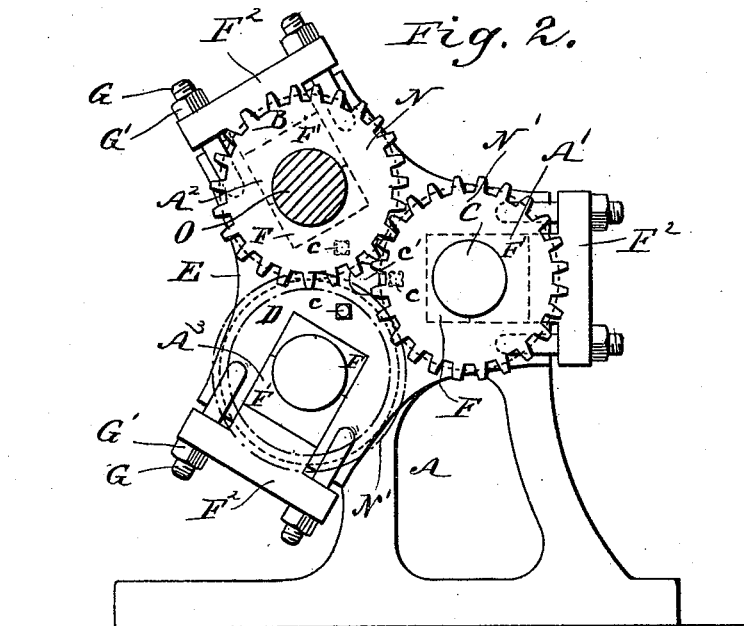
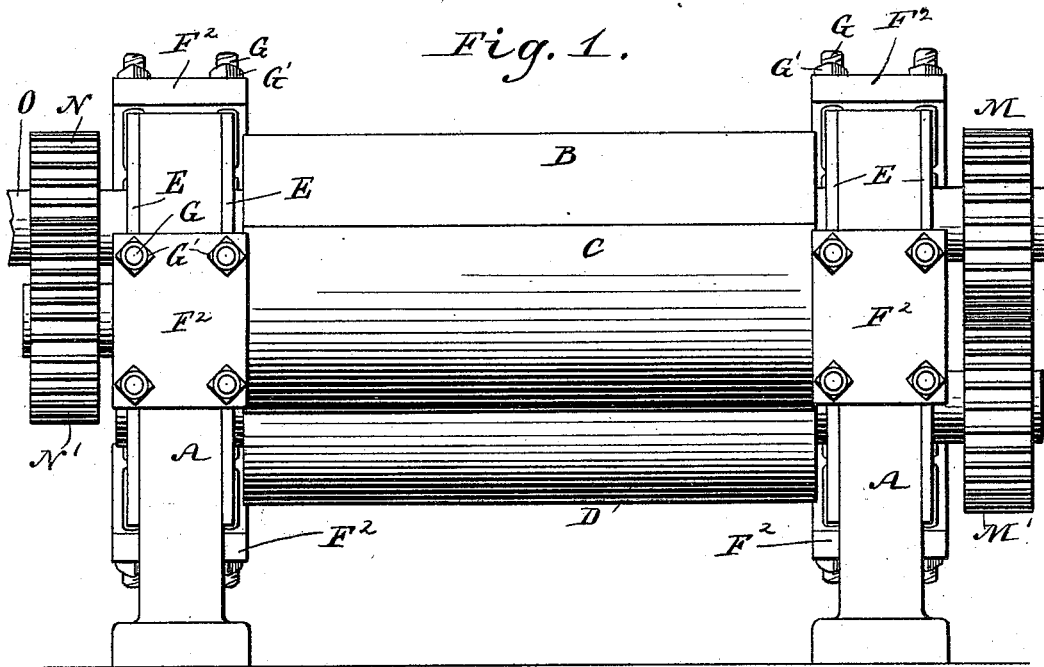
(No Model.)

2 Sheets—Sheet 1.

J. E. HATTON.  
CANE MILL.

No. 421,705.

Patented Feb. 18, 1890.



WITNESSES:  
*John M. Reamer*  
*C. M. Clark*

INVENTOR:  
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ATTORNEYS.

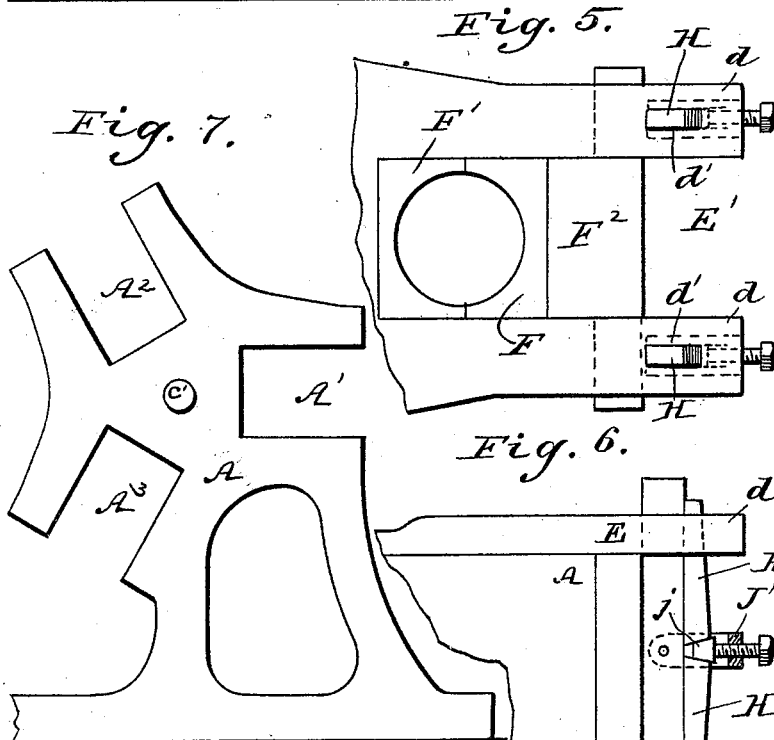
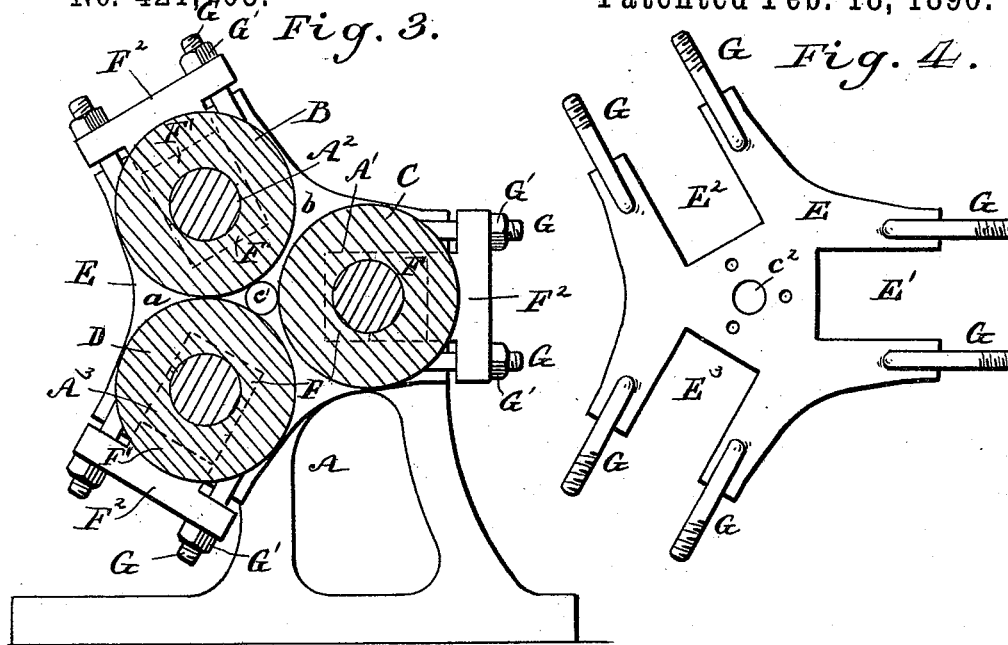
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2 Sheets—Sheet 2.

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WITNESSES:  
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# UNITED STATES PATENT OFFICE.

JOSEPH E. HATTON, OF COLON, CUBA.

## CANE-MILL.

SPECIFICATION forming part of Letters Patent No. 421,705, dated February 18, 1890.

Application filed June 29, 1889. Serial No. 316,034. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH ELENTERIO HATTON, of Colon, Cuba, have invented a new and Improved Cane-Mill, of which the following is a full, clear, and exact description.

My invention relates to roller cane-mills and to that class of such mills which employ two lower rollers and one upper roller arranged to act on both the lower rollers, producing two crushing actions. In the common mill the two lower rollers are placed in the same horizontal plane, so that the two crushing-surfaces are on the same level, and between these two lower rollers is placed a bridge, or what is commonly termed a "knife," to shift the cane after the first pressure to the second lower roller to receive the second pressure. The partially-crushed cane as it comes in contact with this bridge or knife is deflected upward in contact with the upper roller, on which it exerts excessive friction, causing loss of power, and, owing to the retarding action of the rigid and immovable bridge or knife, clogging or choking is frequent, which soon results in the breaking of the main frame and other parts of the mill unless great care is exercised by the attendant.

The object of my invention is to obviate the use of the bridge or knife and the objections incident to its use, and this I accomplish by such arrangement of the rollers as that the second crushing-surface shall be on a lower level than the first, so that the partially-crushed cane is shifted, by the movement of the lowermost roller, on the surface of which the cane strikes on entering the space between the three rollers.

The second object of my invention is to relieve the main frame of the mill (the "cheek-frames," as they are termed) from pressure and danger of breakage; and to this end my invention consists in what I term "separate resistance frames or yokes," in which the rollers have their bearings.

My invention also consists in novel means of adjusting the bearing-blocks of the rollers, and also in the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

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

Figure 1 is a front elevation of my improved cane-mill. Fig. 2 is an end view of the same. Fig. 3 is a sectional elevation showing the relative arrangement of the rollers. Fig. 4 is an enlarged detail view of one of the yokes or resistance-frames. Figs. 5 and 6 are respectively enlarged detail side and front views of one of the bearings, showing the preferred means of adjusting the outer bearing-block; and Fig. 7 is a side view of one of the cheek-frames.

The cheek-frames A A are merely supports for the rollers B C D, and are each formed with three open journal-spaces A' A<sup>2</sup> A<sup>3</sup>, arranged obliquely to each other, like the points of a triangle, the space A' being parallel with the base, the spaces A<sup>2</sup> A<sup>3</sup> being at opposite angles thereto, as shown clearly in Fig. 7, one projecting upward and the other downward and from the horizontal plane of the space A'. The main top roller B stands immediately above the lower or bagasse roller D, and the front or cane roller C is so arranged that its axis is on a line with the meeting surfaces of the rollers B D. By this arrangement the second bite or crushing action at *a* is on a lower level than the first crushing action or bite at *b*, so that the partially-crushed cane drops naturally upon the surface of the lower roller and is carried by the movement thereof directly between the rollers B D without the employment of a bridge or knife, as used in the common three-roller mills. Another object of this arrangement of the rollers is that the strain on the rollers is distributed in an oblique direction to the resistance, and each roller receives its due share only.

E E represent the resistance frames or yokes to take the strain of the rollers and to relieve the main cheek-frames. I prefer to use four of these yokes—one on each side of each of the cheek-frames—although only one on each cheek need be used if made sufficiently strong. The resistance-yokes are each formed with journal-spaces E' E<sup>2</sup> E<sup>3</sup>, arranged obliquely to each other, the same as the open journal-spaces A' A<sup>2</sup> A<sup>3</sup> in the cheek-frames, so that

the journal-spaces of the yokes exactly coincide with the spaces of the cheek-frames when applied thereto. When so applied, the yokes are held in place by set-screws or bolts *c* and studs *c'*, formed on the cheek-pieces, which enter small apertures *c''* in the yokes. The journal-blocks *F F'* for the shafts or gudgeons of the crushing-rollers are placed in the bearing-spaces of the cheek-pieces and resistance-yokes, as shown clearly in Fig. 2, and upon each block *F'* is placed a block or plate *F''* for adjusting the journal blocks and rollers. The plates *F''* may be held by bolts and nuts *G G'*, by keys *H H'*, or by any other suitable means. These plates have no connection with the cheek-pieces, only with the resistance-yokes, the bolts *G* being welded to the arms of the yokes; but the bolts may be separate to be screwed into screw-taps made in the arms of the yokes. By this arrangement it will be seen that the said resistance yokes or frames take the entire strain of the rollers, and that the cheek-pieces act as mere supports and not as working elements of the machine, and in case any of the resistance frames or yokes are broken a new one can be easily and cheaply put in place.

In place of the bolts *G* and nuts thereon for retaining the bearing-blocks and adjusting them I may form the extremities of the resistance frames or yokes with forks *d*, slotted at *d'* to receive the wedge-shaped keys *H H'*. (Shown clearly in Figs. 5 and 6.) These wedges are adjusted by a bolt *J* in the clevis *J'*, attached to the bar *J''*, which bolt is formed with a cone-shaped head *j*, which acts against the adjacent ends of the wedges, and when screwed down serves to spread them with the effect of forcing inward the bearing-blocks, and thus effecting the adjustment of the rollers. By turning outward the bolt *J* the keys

may be tapped back to permit the spreading of the rollers.

The top roller *B* is provided at each end with gear-wheels *M N*, the latter meshing with a gear-wheel *N'* on the front cane-roller *C*, while the former meshes with a gear-wheel *M'* on the lower bagasse-roller *D*, so that motion may be imparted to all the rollers by a single power-shaft *O*. (Shown clearly in Fig. 1.)

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

1. The cheek-frames *A*, formed with open bearings, and the crushing-rollers journaled in blocks fitted in said bearings, in combination with the resistance-frames *F*, applied to the shafts or gudgeons of the rollers and the bearing-blocks, substantially as described.

2. The cheek-frames *A*, formed with three open bearings arranged obliquely to each other, in combination with the three crushing-rollers and the resistance-frames, each formed with open bearings to correspond with the bearings of the cheek-frames, and the outer bearing-blocks held in the cheek-frames by the members of the resistance-frames, substantially as described.

3. The cheek-frames formed with open bearings and the crushing-rollers held by the cheek-frames, in combination with the resistance-frames—one on each side of each cheek-frame—formed with open bearings to correspond with the bearings of the cheek-frames, and the outer bearing-blocks held by the members of the resistance-frames, substantially as described.

JOSEPH E. HATTON.

Witnesses:

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