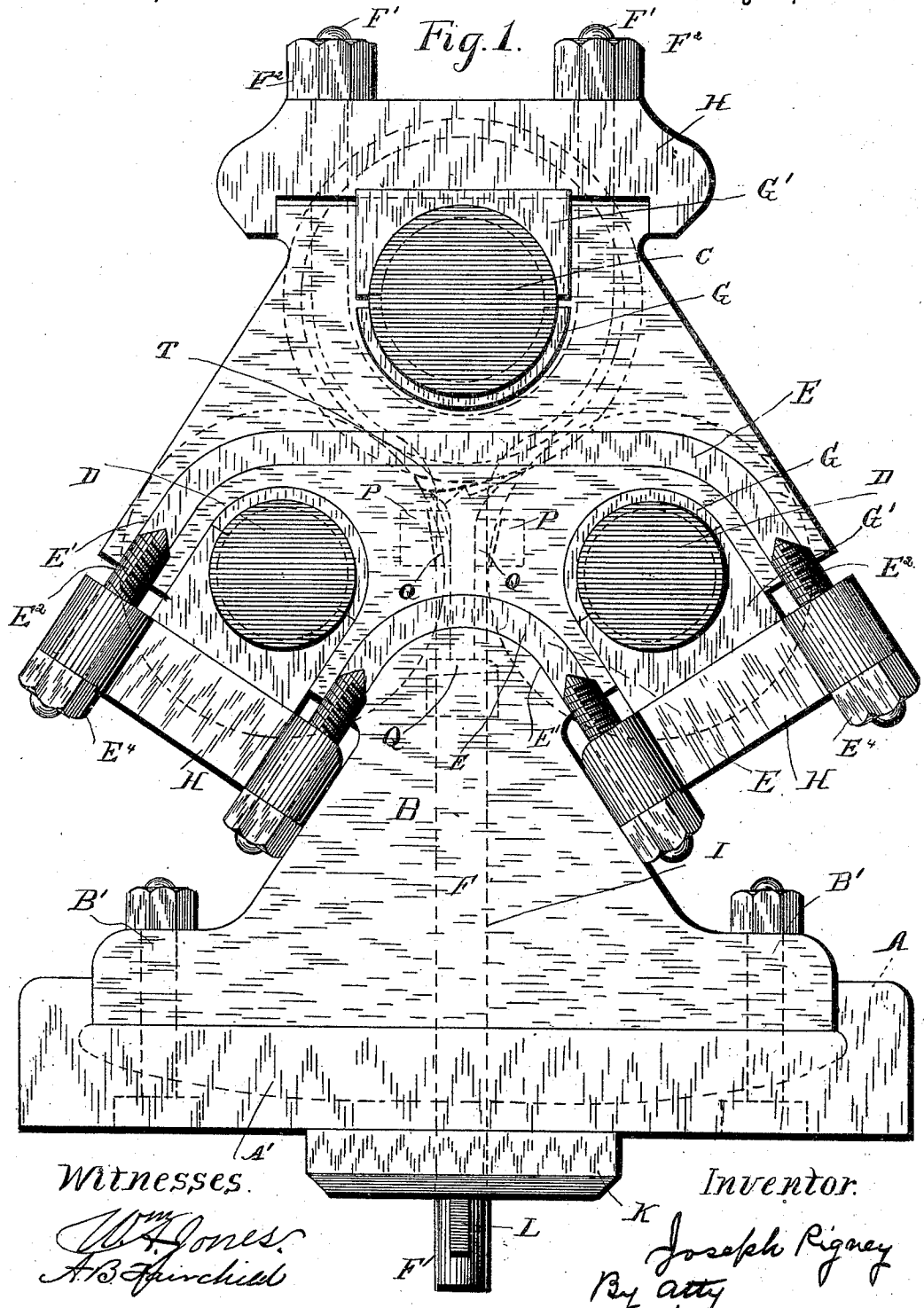
(No Model.) 4 Sheets—Sheet 1.

J. RIGNEY.

CANE MILL.

No. 301,160. Patented July 1, 1884.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

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Fig. 2.

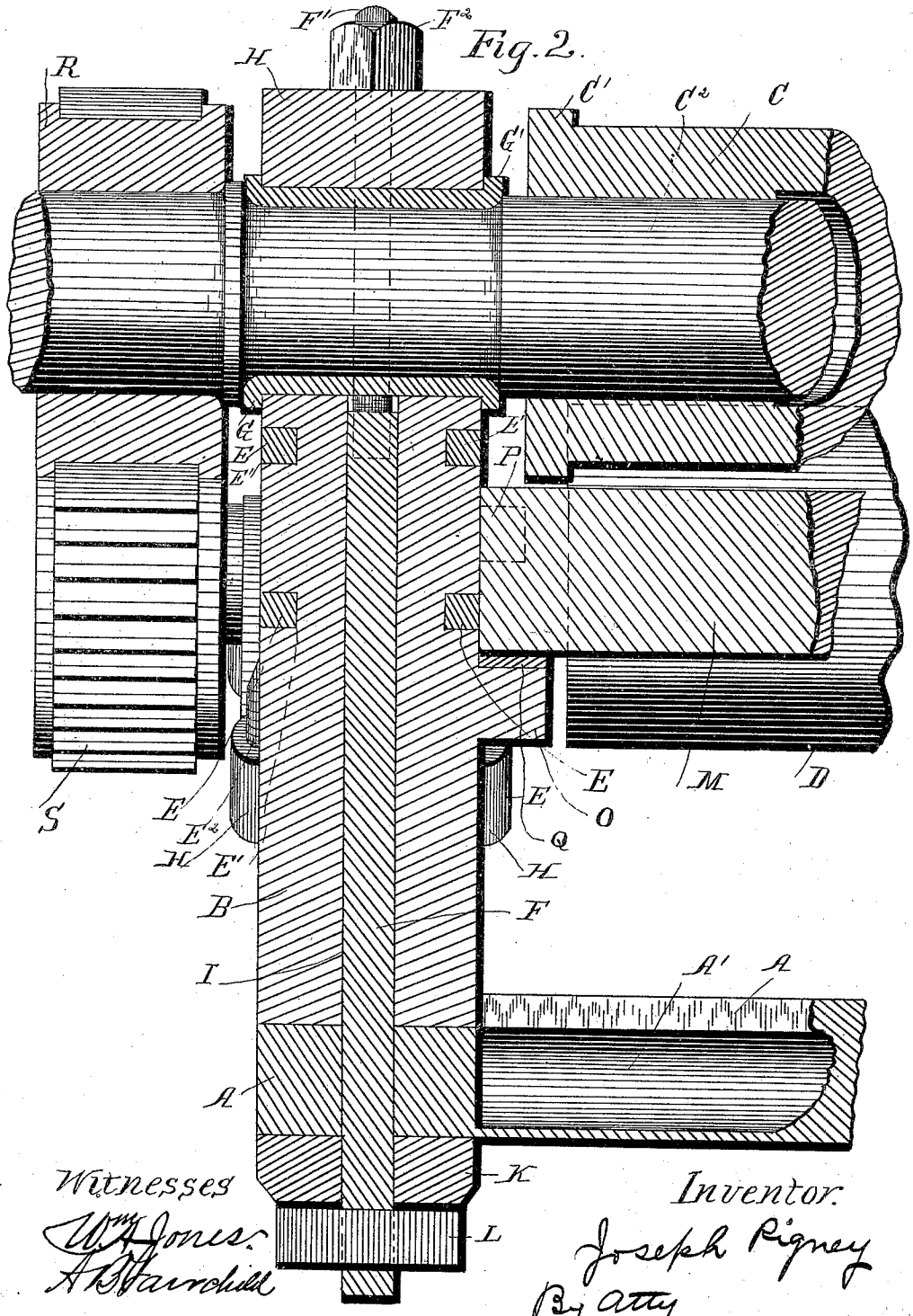

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Fig. 3.

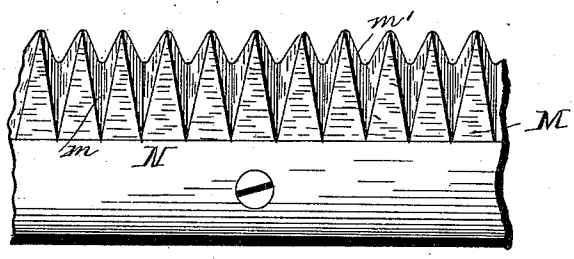


Fig. 5

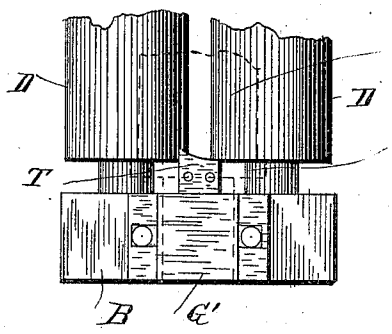
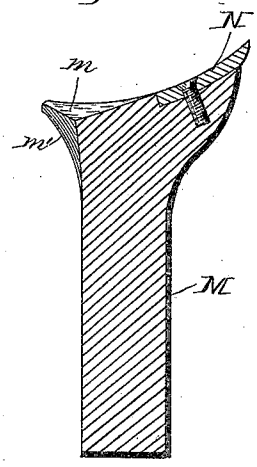


Fig. 4.



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(No Model.) 4 Sheets—Sheet 4.

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CANE MILL.

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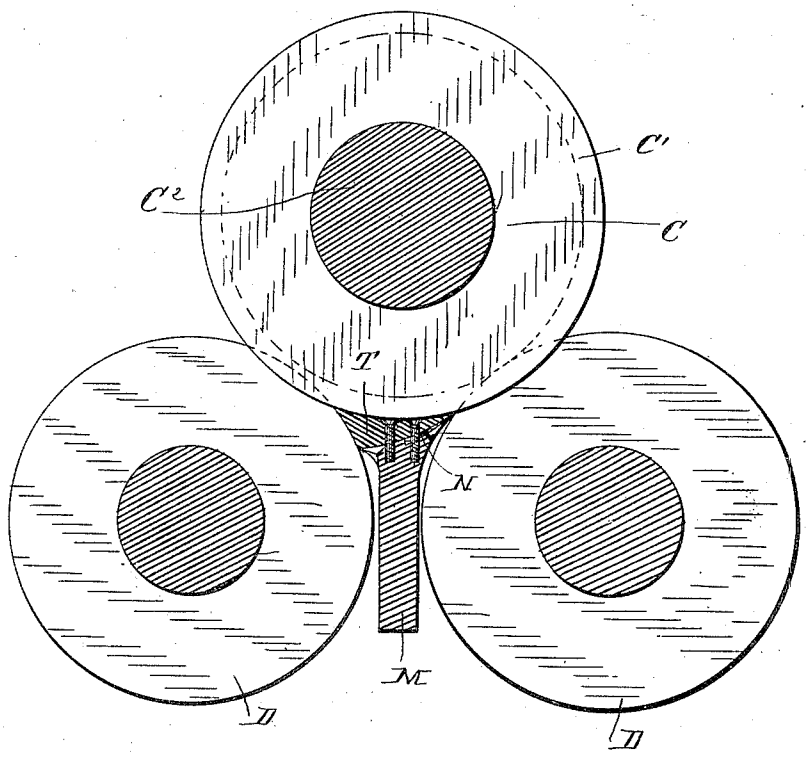
Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH RIGNEY, OF BRIDGEPORT, CONNECTICUT.

CANE-MILL.

SPECIFICATION forming part of Letters Patent No. 301,160, dated July 1, 1884.

Application filed March 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH RIGNEY, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, but temporarily residing at Havana, in the Island of Cuba, have invented certain new and useful Improvements in Cane-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Heretofore in this class of machines, in order to secure the requisite strength and ability to resist both lateral and vertical strains, the construction has been such that the two lower rolls were necessarily some distance apart, thus necessitating the use of a wide stripping-knife, thereby increasing the surface upon which the cane bears, and leaving a large space under the upper roll, in which the cane frequently packed, and either broke the machine or caused vexatious delay while the mass of partly-crushed cane was being removed.

My invention has for its object to so simplify and improve the construction of cane-mills that the excessive friction arising from the packing of the cane will be materially lessened and the yield of juice increased.

With these ends in view my invention consists in the construction and combination of parts, as hereinafter fully described, and specifically pointed out in the claims.

In order that others may understand and use my improved machine, I will proceed to describe its construction, referring by letters to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents an end elevation of the machine, the rolls being indicated in dotted lines, the masonry upon which the bed rests not being shown. Fig. 2 is a partial central section upon the same scale, one of the side rolls being removed, and the shaft of the upper roll being shown in full lines. Figs. 3 and 4 are respectively plan and sectional views of the stripping-knife as I construct it and my improved supporting-beam. Fig. 5 is a plan view on a reduced scale of one end of the machine, showing one of the guide-blocks which prevent the cane from escaping at the ends of the rolls, the cap-piece being removed and the upper roll shown only in dotted lines; and Fig. 6 is an end view of the rolls, the cheek-piece being removed, and the beam and one of the blocks shown in section.

Similar letters indicate like parts in all the figures.

A is the bed-plate of the machine, which is cast with a reservoir, A′, to contain the expressed juice.

B represents one of the cheek-pieces, the companion not being shown. The cheek-pieces are bolted to the bed-plate by heavy bolts B′. In use the bed-plate rests upon a foundation of solid masonry, which is not shown in the drawings.

C is the upper roll, and D D are the lower rolls. The upper roll is slightly longer than the lower ones, and is provided with flanges C′, which pass over the ends of the lower rolls and act to prevent the escape of the cane. The rolls are all journaled in bearings, G G′, which may be of any ordinary construction, and are made of brass or any suitable anti-friction metal.

H H are the cap-plates which hold the bearings and the rolls in their operative positions. It will of course be understood that the wear will be almost entirely upon parts G′; in fact parts G are frequently ordinary iron castings.

E E are curved transverse bolts, preferably square in cross-section, which rest in correspondingly-shaped curved sockets, E′, in opposite sides of the cheek-pieces. Near their ends these bolts are provided with rounded portions E^2, which pass through the cap-plates. The rounded portions are provided with screw-threads, and the cap-plates are held in place by nuts E^4. As the bearings become worn they may be adjusted by tightening up the nuts.

In addition to the sockets E′, the cheek-pieces have each a socket, I, cast therein, which passes down through the center from top to bottom. It may be of any shape in cross-section, and is adapted to accommodate a correspondingly-shaped heavy bolt, F. In the upper portion of the cheek-piece this bolt branches into two arms, F′ F′, between which are the bearings of the upper roll. The ends of both branches are screw-threaded and pass through the upper cap-plate, which is held in place by nuts F^2.

K is a heavy washer below the bed-plate, through which bolt F passes, the parts being secured together by a key, L. In practice an opening is left in the masonry upon which the bed rests to allow of access to the key.

M is a heavy beam, preferably of iron, extending longitudinally of the machine between the two cheek-pieces, which serves to strengthen the machine, and also as a support for the stripping-knife N. This beam or support rests upon lugs O, which are cast upon the inner sides of the cheek-pieces.

P P are lugs, also cast upon the cheek-pieces, which support the opposite sides of beam M. The desired adjustment of the beam is secured by means of wedges Q, which are driven in between the lugs and the beam. The stripping-knife N is secured directly to the beam, as shown in Figs. 3 and 4. In these figures I have also illustrated my improved means for preventing waste of the expressed juice, which at the same time assists to prevent the cane from packing or clogging between the rolls. This is accomplished by means of a series of grooves in the top and side of beam M opposite to where the cane enters.

m represents the grooves in the top of the beam, which begin just back of the stripping-knife, and slope downward and outward until they meet and merge into corresponding grooves, *m'*, upon the side of the beam.

T represents raised blocks or guides—one at each end of the machine—which are bolted to the upper side of the knife-beam and extend outward and rest against the cheek-pieces. These guides fit closely against the upper surface of the knife and the beam, and bear against the lower rolls, (see Fig. 1,) and against the flange of the upper roll, being accurately fitted to the curves of the rolls. It will be noticed in Fig. 5 that the rear face of each guide is longer than the front face, so that the cane is guided inward from the flanges of the upper roll, and all escape therefore at the ends of the left lower roll is prevented. As these guide-blocks extend outward to the cheek-pieces, there is no possibility of their being displaced by lateral strain of the cane while passing over the knife. They are bolted to the knife or to the beam, so that they may be raised by wedges and their contact with the upper roll preserved in the event of the knife being lowered.

The operation is as follows: Power is applied by means of gears, as indicated in Fig. 2, in which the gear R upon the shaft C^2 of the upper roll is shown in section, and the gear S upon the shaft of one of the lower rolls in full lines.

Turning now to Fig. 1, which shows the opposite end of the machine in elevation, the upper roll is caused to rotate from left to right and the two lower rolls from right to left. The cane enters the machine at the right, passing between the upper and the right lower roll. It will be observed (see dotted lines in Fig. 1) that there is a perceptible space between these two rolls. The stripping-knife (see Fig. 1) bears upon the surface of the right lower roll and prevents the cane from being carried around thereby, causing it to pass over the surface of the stripping-knife and the beam, then out between the upper and the left lower roll. It will be observed that the upper and the left lower roll are very close together.

The advantages of the construction I have shown may be briefly summed up as follows: By placing the vertical bolts in the center of the cheek-pieces and curving the transverse bolts I am enabled to place the bearings on the lower rolls in the under sides of the cheek-pieces, thereby bringing the lower rolls much closer together and lessening the space in which the cane can pack. It will readily be seen that by lessening the frictional surface I am able to utilize much of the power that has heretofore been expended in overcoming the friction, thereby greatly increasing the capacity of the machine. Another great advantage of the construction I have shown is that either of the rolls may be readily removed without disturbing the adjustment of the others. The grooves in the beam also assist in lessening the friction by lessening the bearing-surface. They also form sluices for the juice of the cane, which is thus allowed to pass directly down into the reservoir, and is in less danger of being forced out with the crushed cane.

Having thus described my invention, I claim—

1. The combination, with the cheek-pieces and the rolls, of curved transverse bolts, the cap-pieces of the lower rolls, vertical bolts having branches between which the upper roll is journaled, and the cap-pieces of the upper roll, substantially as and for the purpose set forth.

2. In a cane-mill, the cheek-pieces having central vertical sockets and curved transverse sockets on opposite sides thereof, in combination with bolts which fit the sockets, and cap-pieces in which the rolls are journaled.

3. The cheek-pieces having bearings in their lower sides for the under rolls, and curved transverse bolt-sockets, in combination with bolts which fit the sockets and are screw-threaded at both ends, and caps through which the bolts pass to hold the rolls in place.

4. In a cane-mill, the cheek-pieces having central vertical sockets, in combination with bolts fitting said sockets, said bolts having arms at their upper ends between which the upper roll is journaled.

5. In a cane-mill, a beam provided with the stripping-knife, said beam having grooves upon the top, beginning back of the knife and extending downward and outward, and merging into corresponding grooves upon the side thereof, as described, and for the purpose set forth.

6. The combination, with the cheek-pieces, the rolls, and a beam provided with the strip-

ping-knife, of guide-blocks resting against the cheek-pieces, which fill the space between the rolls at the ends of the machine, and are bolted to the knife or beam, whereby the cane is prevented from escaping at the ends of the rolls.

7. In a cane-mill, the combination, with the rolls, of a beam and a guide-block at each end thereof, which wholly fills the space between the rolls and the beam, and whose inner faces are curved inward, as shown, whereby the cane is guided toward the center of the left lower roll, as and for the purpose set forth.

8. The cheek-pieces, the vertical bolts having arms, the upper roll, and the curved transverse bolts, in combination with the under rolls journaled in the under sides of the cheek-pieces, and a metallic beam between them provided with the stripping-knife.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH RIGNEY.

Witnesses:

M. B. TOZER,

ROBERT RIGNEY.