

(No Model.)

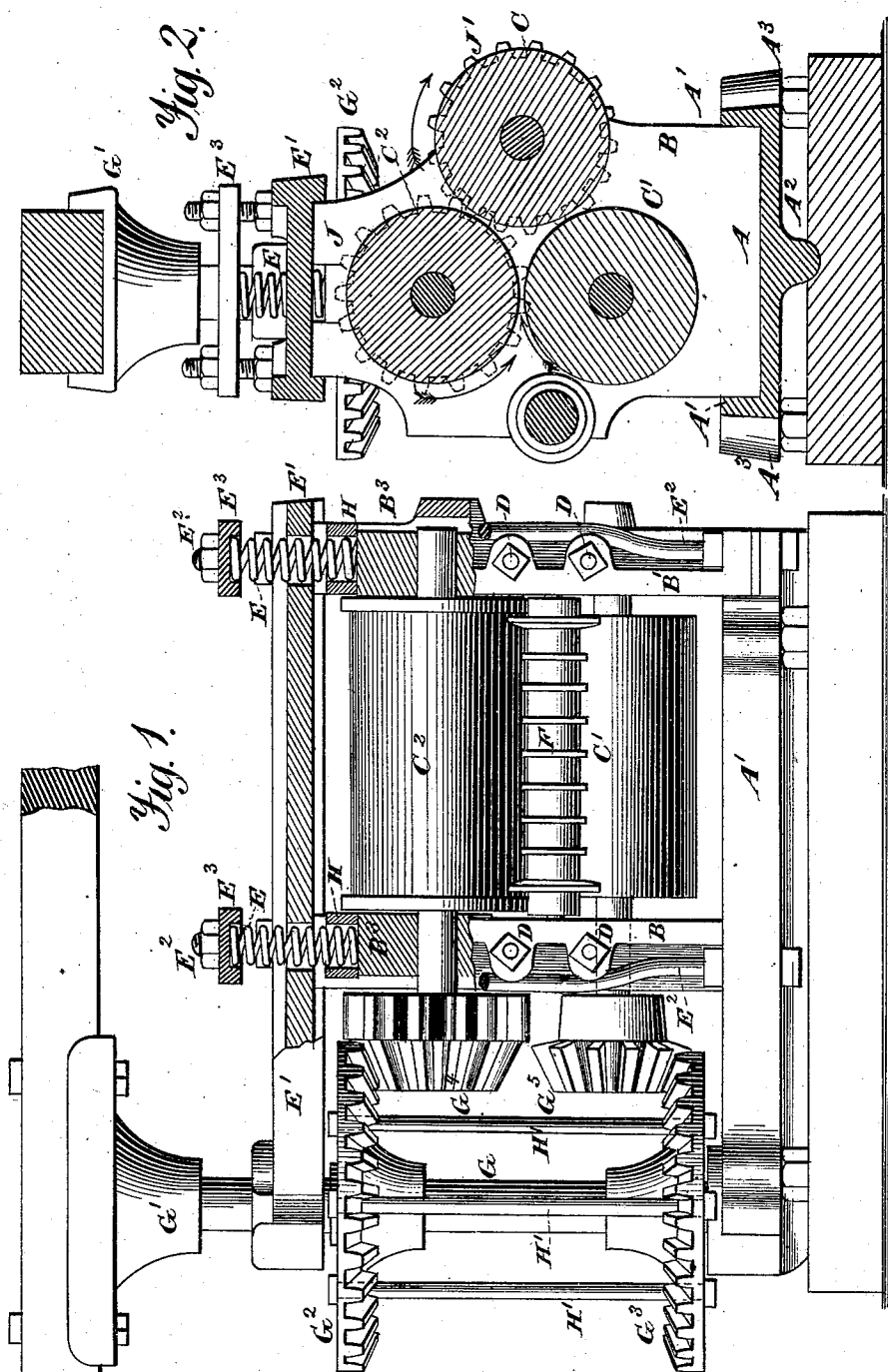
2 Sheets—Sheet 1.

D. WILDE.

CANE MILL.

No. 255,228.

Patented Mar. 21, 1882.



Witnesses.  
A. Ruppert.  
H. H. Schmitt

D. Wilde  
Inventor.  
Holloway & Blanchard  
Atty.

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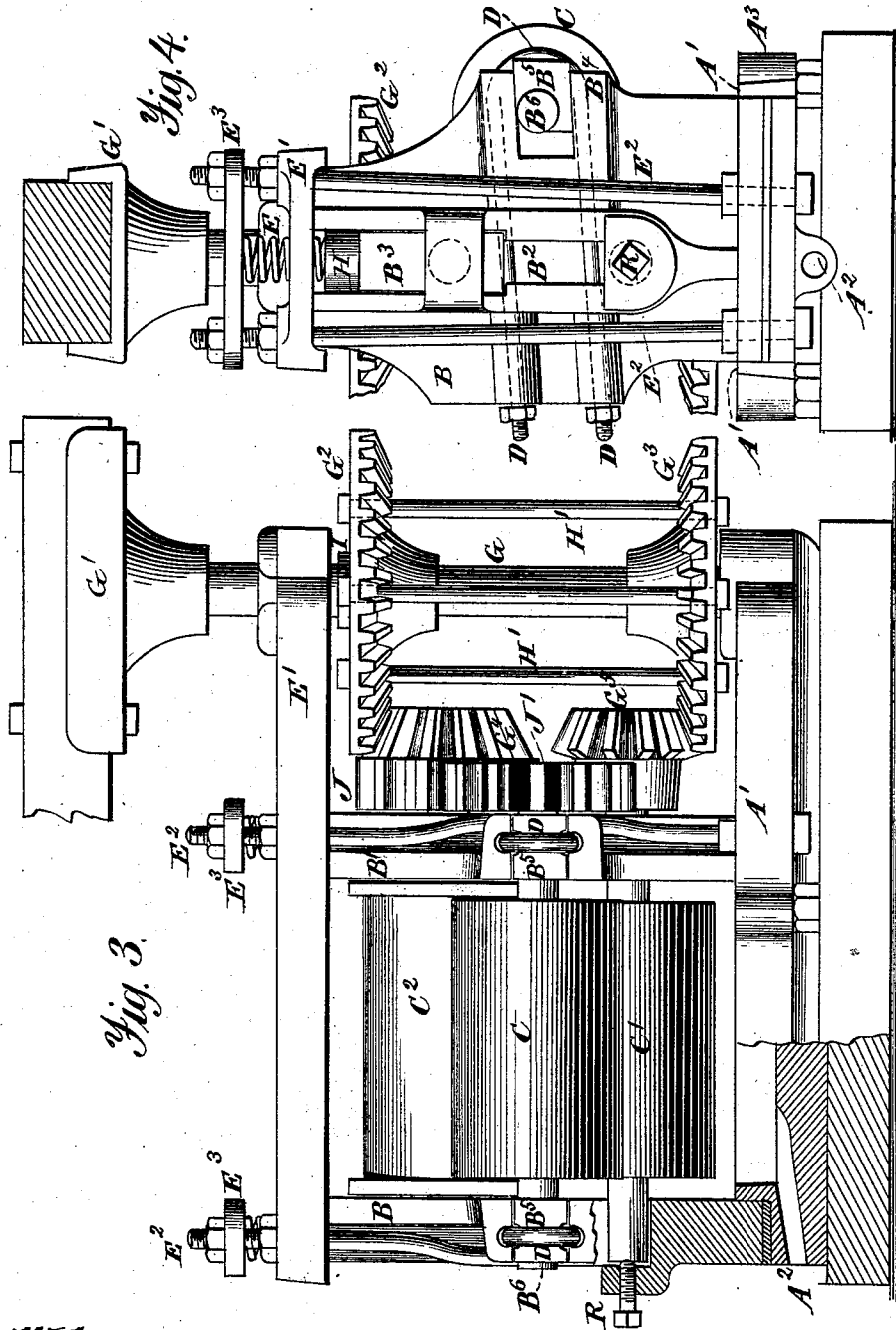
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# UNITED STATES PATENT OFFICE.

DANIEL WILDE, OF WASHINGTON, IOWA.

## CANE-MILL.

SPECIFICATION forming part of Letters Patent No. 255,228, dated March 21, 1882.

Application filed December 2, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL WILDE, a citizen of the United States, residing at Washington, in the county of Washington and State of Iowa, 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to mills for grinding or crushing sugar-cane, sorghum, and other similar substances; and the object of my improvement is, first, to provide such a construction and combination of the parts as will enable me to place the two crushing-rolls one directly above the other, and to drive each one of them directly from a vertical driving-shaft; second, to combine with the grinding or crushing rolls a discharge-roll so arranged with reference to the grinding or crushing rolls that it shall give an upward movement to the bagasse, as a consequence of which the juice is separated therefrom and allowed to flow downward into a reservoir provided for its reception; third, to provide a novel form of roller or drum for aiding in passing the stalks to the rolls where they are crushed; and, fourth, to provide certain combinations and arrangements of the other parts of which the machine is composed. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, illustrating my improved mill, it showing the frame-work to which the working parts are attached, a vertical shaft with its driving-gears, a gear-wheel for driving the discharging-roll, the grinding or crushing roll, springs for regulating the position of the upper crushing-roll, and rods for regulating the tension of the springs. Fig. 2 is a central transverse sectional elevation, showing the position of the discharging-roll with reference to the crushing-rolls and of the feeding-roll. Fig. 3 is an elevation, partly in section, of the reverse side of the machine, showing the method of arranging the rolls in the frame, and a set-screw for preventing the endwise movement of the crushing-rolls; and Fig. 4 is an end elevation,

showing the method of arranging the bearings of the discharging-roll.

Similar letters refer to similar parts throughout the several views.

In constructing this type of machines I provide a bed-plate, A, having upon its edges flanges A' A', which form beneath the grinding or crushing rolls a reservoir for the reception of the juice as it falls down, and from which it is allowed to flow through an aperture, A<sup>2</sup>, the inner end of which communicates with said reservoir. Upon the outer surfaces of the flanges A' projections A<sup>3</sup> A<sup>3</sup> are provided, through which bolts pass for securing the machine to the floor or to a platform.

To the bed-plate A there are secured two vertical plates of metal, B B', in the centers of which there are formed slots B<sup>2</sup>, the lower ends of which constitute bearings for the journals of the lower grinding or crushing roller to rest and turn in, as shown in Fig. 4, while their upper ends are provided with boxes B<sup>3</sup>, which form the bearings for the upper adjustable crushing-roller. The parts B and B' are also provided with projections B<sup>4</sup>, in which there are formed slots for the reception of boxes B<sup>5</sup>, which support the journals B<sup>6</sup> of the discharge-roller C, said roller having its axis arranged above the axis of the roller C', but below that of C<sup>2</sup>, in order that the bagasse or stalks of the material being acted upon may, upon leaving the crushing-rolls, have an upward inclination given to it, and thus be entirely separated from the juice, which will fall down into the reservoir in plate A. By this arrangement the bagasse is prevented from absorbing any of the juice after it has been separated therefrom by passing the crushing-rolls. The longitudinal position of the discharging-roller with reference to the crushing-rolls is regulated by means of bolts or of staples D D, which pass horizontally through the plates B and B', as shown in Figs. 1 and 4, and around the boxes B<sup>5</sup>, their ends being supplied with nuts for regulating their position.

As a means of providing for the rising and falling of the upper crushing-roller, C<sup>2</sup>, springs E E are placed above the boxes B<sup>3</sup> B<sup>3</sup>, as shown in Figs. 1 and 4, their lower ends resting thereon, they extending therefrom up through a plate, E', which constitutes the upper portion of the frame of the machine, it being secured

in position by the rods or bolts  $E^2$   $E^2$  and the nuts placed thereon. Upon the upper ends of the rods  $E^2$  there are placed bars of metal  $E^3$   $E^3$ , the under surfaces of which are provided with pockets for the upper ends of the springs  $E$  to rest in. The arrangement of these parts is such that should more material be fed to the machine than can be passed between the crushing-rolls, when they are at their usual distance apart, the springs will yield and allow the extra quantity to pass without breaking any part of the machine, but will, so soon as it has passed, return the roller to its proper position, the tension of the springs being sufficient under ordinary circumstances to prevent such a rising of the upper roller as to allow any of the material to pass without having all of the juice pressed out of it, or as nearly all as is practicable with any machine used for that purpose.

For the purpose of facilitating the introduction of the cane between the crushing-rolls there is journaled in the plates  $B$  and  $B'$  a corrugated roller,  $F$ , upon which the stalks are to be placed, it being rotated by the movement of said stalks after their ends have passed between the rolls, while at the same time it forms a rest for the stalks and prevents their outer ends from falling down, and thus coming in the way of the operator.

For the purpose of providing for the requisite movement of the crushing and discharging rolls there is stepped in the lower plate,  $A$ , a vertical shaft,  $G$ , which extends upward and through the upper plate,  $E'$ , its upper end being furnished with a socket,  $G'$ , into which a sweep may be placed, so as to admit of the machine being driven by animals attached thereto; or a gear-wheel or a pulley may be attached thereto and it be driven by any prime mover.

Upon the shaft  $G$ , and between the two plates of the frame, there are secured two beveled-gear wheels,  $G^2$  and  $G^3$ , their faces or toothed surfaces being placed so as to cause them to face each other, and their distance apart being such that they will mesh respectively into other beveled gear wheels,  $G^4$  and  $G^5$ , placed on the journals or shafts of the crushing-rolls. The object sought to be accomplished by this arrangement of the driving gear-wheels is to produce a perfectly uniform movement of the surfaces of the crushing-rolls, and at the same time divide the labor of driving said rolls between two wheels, instead of causing one wheel to do all of the work, as in machines at present existing. In order that this may be done, and at the same time that the requisite amount of vertical movement may be imparted to the upper crushing-roller, as above described, and it prevented from rising too far, the amount of such movement is limited by placing upon the boxes  $B^3$  washers  $H$ , as shown in Figs. 1 and 4, so that when said roller has been raised by the material passing between it and the lower one sufficiently far to allow the undue quantity of material to pass said washers come in contact with the upper plate of the

frame, and its further vertical movement is arrested; but in order that this may be done it is necessary that provision should be made for a separation of the wheels  $G^4$  and  $G^5$  to as great an extent as that caused between the rolls  $C'$  and  $C^2$ .

As the wheels  $G^2$  and  $G^3$  cannot be separated, owing to the fact that they are fast upon their shaft, and to the further fact that they are prevented by bolts  $H'$ , it follows that provision must be made for the separation of the wheels  $G^4$  and  $G^5$ , above alluded to, in some other way. The provision made for this purpose consists in making the cogs of the wheels  $G^2$ ,  $G^3$ ,  $G^4$ , and  $G^5$  of greater depth than would be required otherwise, so that as the roller  $C^2$  is raised it shall carry with it the vertical shaft and its wheels, thus causing a deeper mesh of the teeth, a limit to such movement being caused by a collar,  $I$ , placed between the wheel  $G^2$  and the upper plate of the frame, such limit being the same as that provided for the movement of the roller, or such limit may be fixed by extending upward the hub of wheel  $G^2$ . This arrangement of the parts makes it possible to allow the required vertical movement of the roller without deranging the gearing or interfering with its proper functions.

By securing the wheels  $G^2$  and  $G^3$  upon their shaft by means of a feather and spline the bolts  $H'$  may be made to cause them to approach each other to such an extent as to compensate for any wear that may occur on the cogs, and they may thus be made to rise and fall the required distance upon the shaft without moving said shaft.

For driving the discharge-roll there is placed upon the shaft of the roller  $C^2$  a spur-wheel,  $J$ , the diameter of which is such as to cause it to mesh into a similar wheel,  $J'$ , mounted upon and firmly attached to the shaft of the discharge-roll, the effect being to impart to the last-named roll the required movement.

As a means of preventing the endwise movement of the crushing-rolls, set-screws  $R$   $R$  are passed through the end plates and made to bear against the ends of the shaft of said rolls.

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

1. In a mill or machine for grinding or crushing sugar-cane, sorghum, and other similar substances, the combination of the beveled driving-wheels  $G^2$   $G^3$ , placed on a vertical shaft, the beveled wheels  $G^4$  and  $G^5$ , and the grinding or crushing rolls  $C'$  and  $C^2$ , placed one above the other and driven by separate gears, substantially as and for the purpose set forth.

2. The combination of the grinding or crushing rolls  $C'$   $C^2$  and the bagasse-discharging rolls, the latter being arranged with reference to the grinding or crushing rolls, substantially as described, whereby it is made to give an upward inclination to the bagasse, and thus effectually separate it from the juice, as described.

3. In combination with the grinding or crush-

ing rolls of a cane-mill, the feed-roller E, which is capable of being rotated by the cane as it is fed to the mill, substantially as set forth.

4. The combination of the gear-wheels G<sup>2</sup>, 5 G<sup>4</sup>, J, and J', and the discharging-roller C, the parts being arranged for joint operation substantially as and for the purpose set forth.

5. The combination of the grinding or crushing roller C<sup>2</sup>, the springs E E, the bolts E<sup>2</sup>, 10 caps E<sup>3</sup>, boxes B<sup>3</sup>, and washers H, the parts being substantially as set forth, whereby they are made to control the vertical rise and fall of the upper crushing-roller, as set forth.

6. The combination of the vertical shaft G, 15 the gear-wheels G<sup>2</sup> and G<sup>3</sup>, and the adjusting-bolts H', they being arranged substantially as and for the purpose set forth.

7. In combination with the driving-gear G<sup>4</sup> and G<sup>5</sup> of a cane-crushing mill, the driving-shaft G, having upon it driving-wheels G<sup>2</sup> and 20 G<sup>3</sup>, and having a vertical as well as a rotary movement imparted to it, said vertical movement being simultaneous with and caused by the vertical movement of the upper crushing-roller, all substantially as described, and for 25 the purpose set forth.

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

DANIEL WILDE.

Witnesses:

A. S. FOLGER,  
JOHN WILDE.