(No Model.)

J. STUBBS.

SUGAR CANE MILL.

No. 253,782. Patented Feb. 14, 1882.

Fig. 1

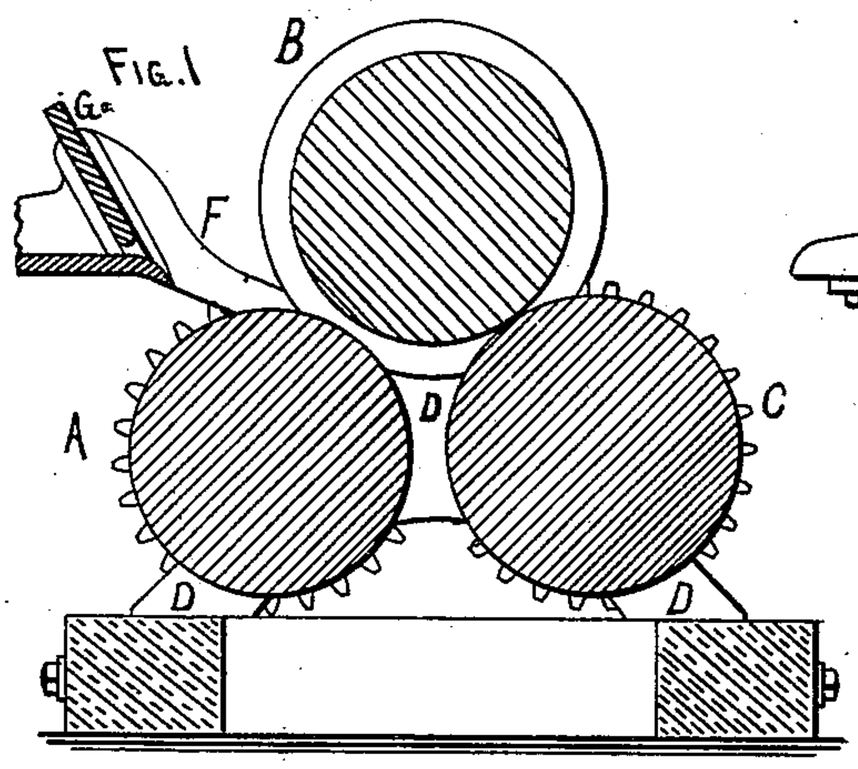


Fig. 2

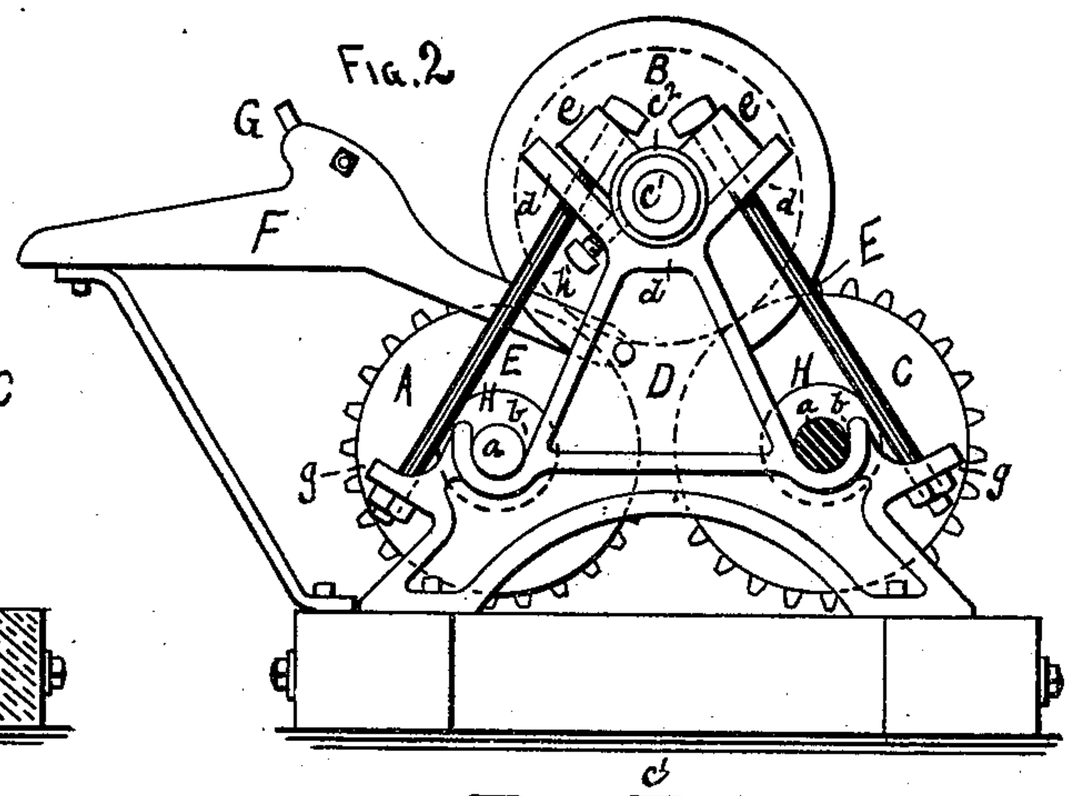


Fig. 3

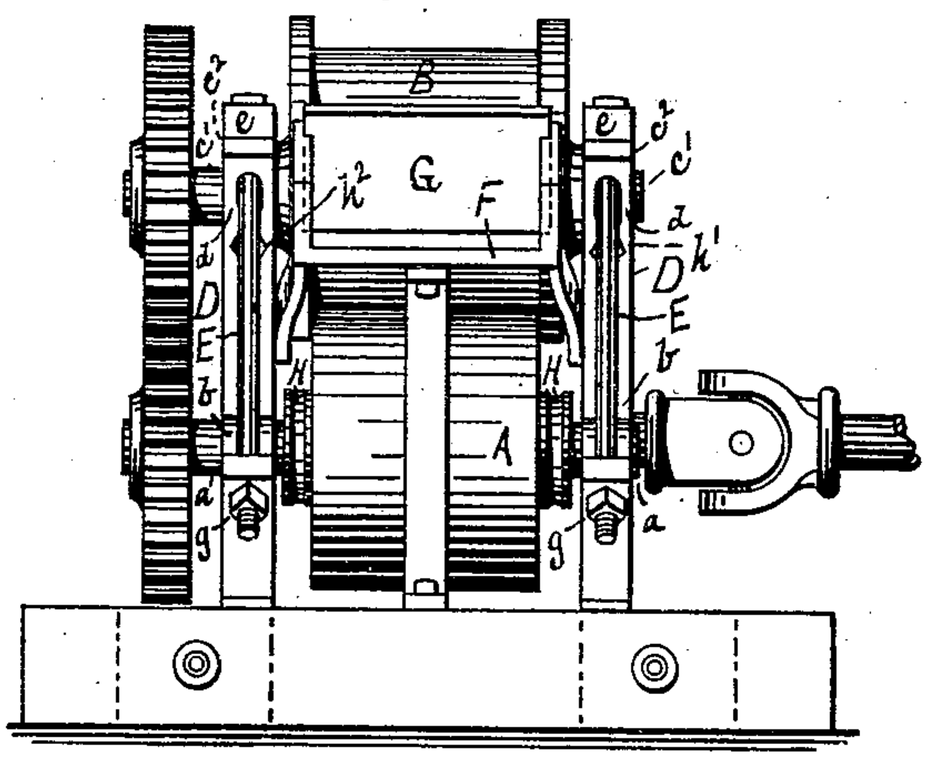


Fig. 4

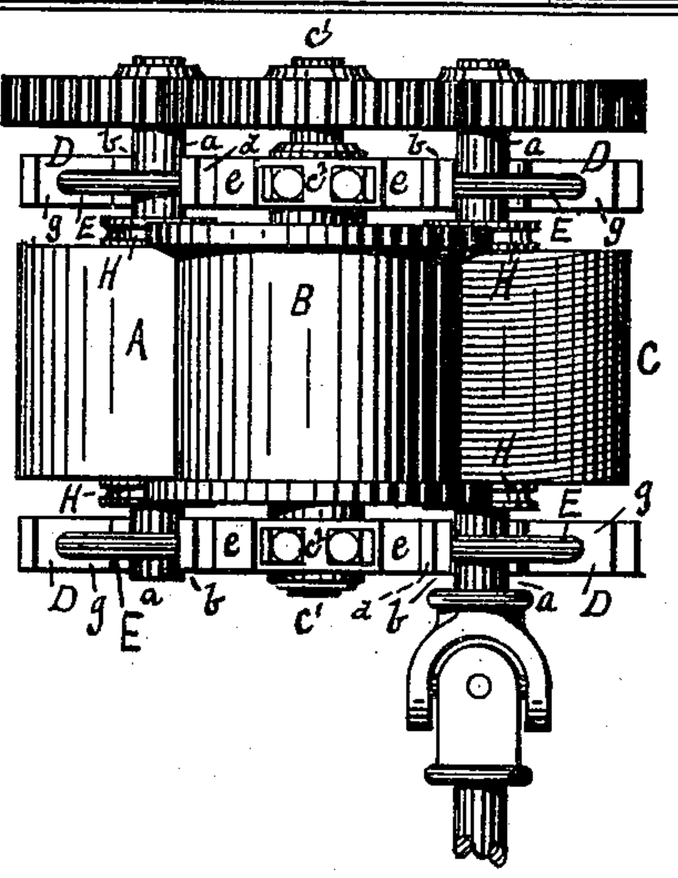


Fig. 5

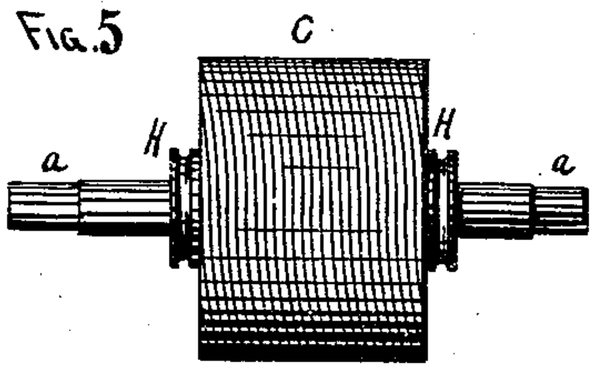
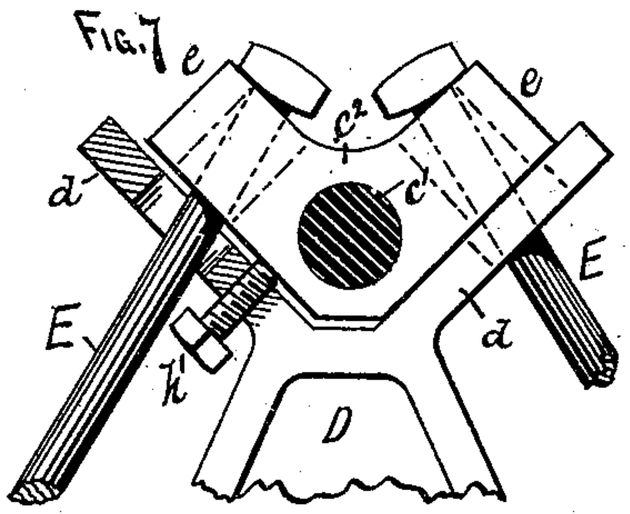


Fig. 6

Fig. 7



WITNESSES.
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Joel Stubbs.
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UNITED STATES PATENT OFFICE.

JOEL STUBBS, OF MINNEAPOLIS, MINNESOTA.

SUGAR-CANE MILL.

SPECIFICATION forming part of Letters Patent No. 253,782, dated February 14, 1882.

Application filed August 4, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOEL STUBBS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Sugar-Cane Mills, of which the following is a specification.

This invention relates to mills for crushing sugar-cane and the like; and it consists in the construction and the combination of parts hereinafter particularly described and then sought to be specifically defined by the claims.

In the accompanying drawings, Figure 1 is a sectional end view. Fig. 2 is an outside end elevation. Fig. 3 is a front elevation, and Fig. 4 is a plan view with the feed-gage removed. Fig. 5 is a view of the discharge-roller detached. Fig. 6 is a view of a section of the face of the discharge-roller, showing the form of the diagonal furrows. Fig. 7 is an enlarged detached view of a portion of the frame and main-wheel adjusting mechanism.

In the ordinary cane-mills where the feed and discharge rolls are of the same size and travel at the same rate of speed, and with the discharge-roller set nearer to the main roller than the feed-roller is, the cane is liable to become clogged between the rolls, because the discharge is not as rapid as the feed; and to obviate this difficulty is the principal object of my invention, which consists in increasing the speed of the discharge-roll, so that it will carry off the crushed cane as fast as it is fed in, and thus prevent clogging. This increase of speed need not be more than about one inch in thirty, and may be accomplished in two ways, either by increasing the diameter of the discharge-roll or decreasing the gear which operates it. I prefer the former method; and I find that making the discharge-roll one-fourth ($\frac{1}{4}$) of an inch greater in diameter than the feed-roll is about the proper proportion in a ten (10) inch mill. These proportions are retained in the drawings, in which A is the feed-roller, B the main or upper roller, and C the discharge-roller.

D is the frame, in which the feed and discharge rollers rest by their journals *a* in open-topped bearings *b*, so that they may be readily removed, while the main-roll journals *c'* are provided with angular boxes c^2, which rest in forked bearings *d* upon the upper part of the frame D. These angular boxes c^2 are provided with projections *e*, through which and the forked bearings *d* and lugs *g* on the frame D large rods E pass, so that the whole upward strain of the main roll B is borne by these rods E and the lower part of the frame D.

h' h^2 are set-screws tapped through the sides of the forked bearings *d*, which are toward the feed-roller, and adapted to adjust the angular boxes c^2 up or down the opposite incline of the forked bearing (see Fig. 7) to set the main roller farther from or nearer to the feed-roller. In all mills of this class the space between the feed-roll and main roll should be greater than the space between the main roll and discharge-roll, for the reason that after the cane is crushed it occupies less space than before, and consequently the discharge-space must be less than the feed-space to subject the crushed cane to the required pressure. Experiments have shown that the best results are obtained and the mill operated with the expenditure of the least amount of power to produce the largest amount of work when the feed-roll is about twice as far from the main roll as the discharge-roll is from the main roll, and the nearer this proportional distance is retained the more satisfactorily the mill will operate. To secure this constant proportional distance by the single adjustment of the main roll is the object of thus constructing the angular bearings, the angles of the bearings *d* and boxes c^2 being such that the main roller will be moved by the set-screws h' h^2 away from or nearer to the feed-roller just twice as fast as it is moved away from or nearer to the discharge-roller.

When it is desired to so adjust the main roller the rods E are loosened and then again tightened after the adjustment.

In order to prevent the rolls from slipping over the cane, and also to direct the flow of juice into the vessel therefor under the rolls, the roll C is formed with furrows running at an angle, as illustrated in Figs. 5 and 6.

The juice sometimes runs over the ends of the rolls and flows out upon the journals into the bearings, and to prevent this I form grooved collars H upon the ends of the rolls A C to catch the juice and cause it to run down and drip off into the pan and not reach the journals.

The top roll, B, is also provided with flanges

adapted to fit against both lower rolls, below the surfaces thereof, so as to not only prevent the juice from running over the edges of the top roll, but also to direct it onto both lower rolls, whereby it will be more freely delivered into the vessels beneath these rolls.

F is a frame or feed-spout attached to the side of the frame D, and provided, at some distance in front of the point of junction of the feed and main rollers, with an inclined adjustable slide or feed gage, G, made adjustable by fitting snugly into grooves in the frame, or by set-screws passed through the frame so as to bear against the slide, and beneath which the stalks are fed to the mill, and by adjusting it higher or lower the quantity may be regulated.

The feed-gage is placed some distance from the point of junction of the feed and main rolls, whereby the operator is enabled to bend the stalks from side to side and cause them to pass through the mill at any part desired, and even after they have run partially through change their courses. This enables him to feed the mill evenly and place stalks in at any desired point.

What I claim as new is—

1. In a sugar-cane mill, the combination of a main or pressure roll, a feed-roll, and a discharge-roll, the discharge-roll being adapted to rotate at a higher rate of speed than the feed-roll, whereby the cane is rapidly discharged and clogging prevented, substantially as set forth.

2. The combination of the rollers A B C, frame D, having the forked bearings *d*, angular boxes c^2, and set-screws h' h^2, substantially as set forth.

3. The combination of the rollers A B C, frame D, having the forked bearings *d*, angular boxes c^2, and rods E, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOEL STUBBS.

Witnesses:

C. N. WOODWARD,

LOUIS FEESER, Sr.