(No Model.) 2 Sheets—Sheet 1.

A. YOUNG.

MEANS FOR FEEDING BAGASSE TO ROLLER MILLS.

No. 362,810. Patented May 10, 1887.

Fig. 1.

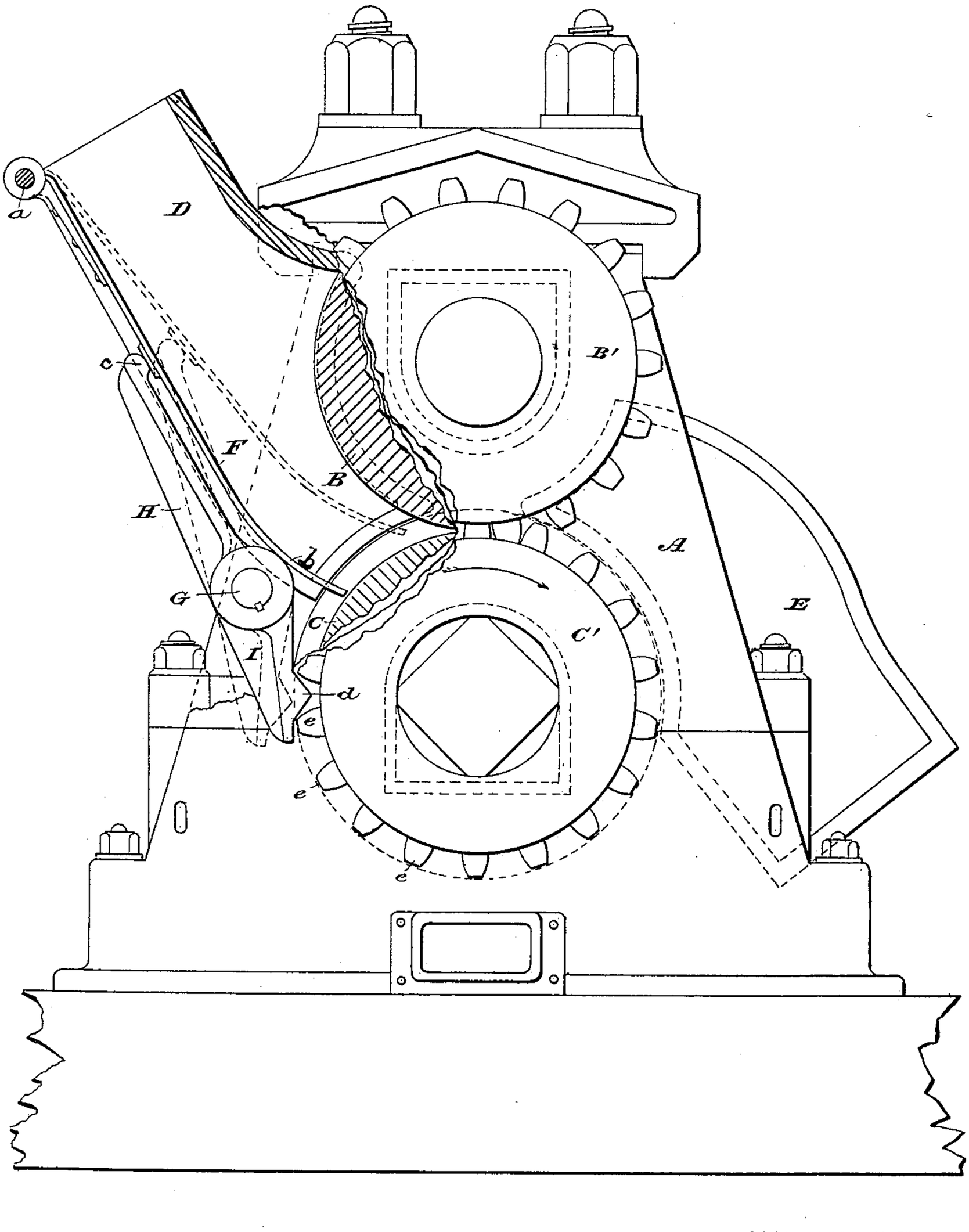

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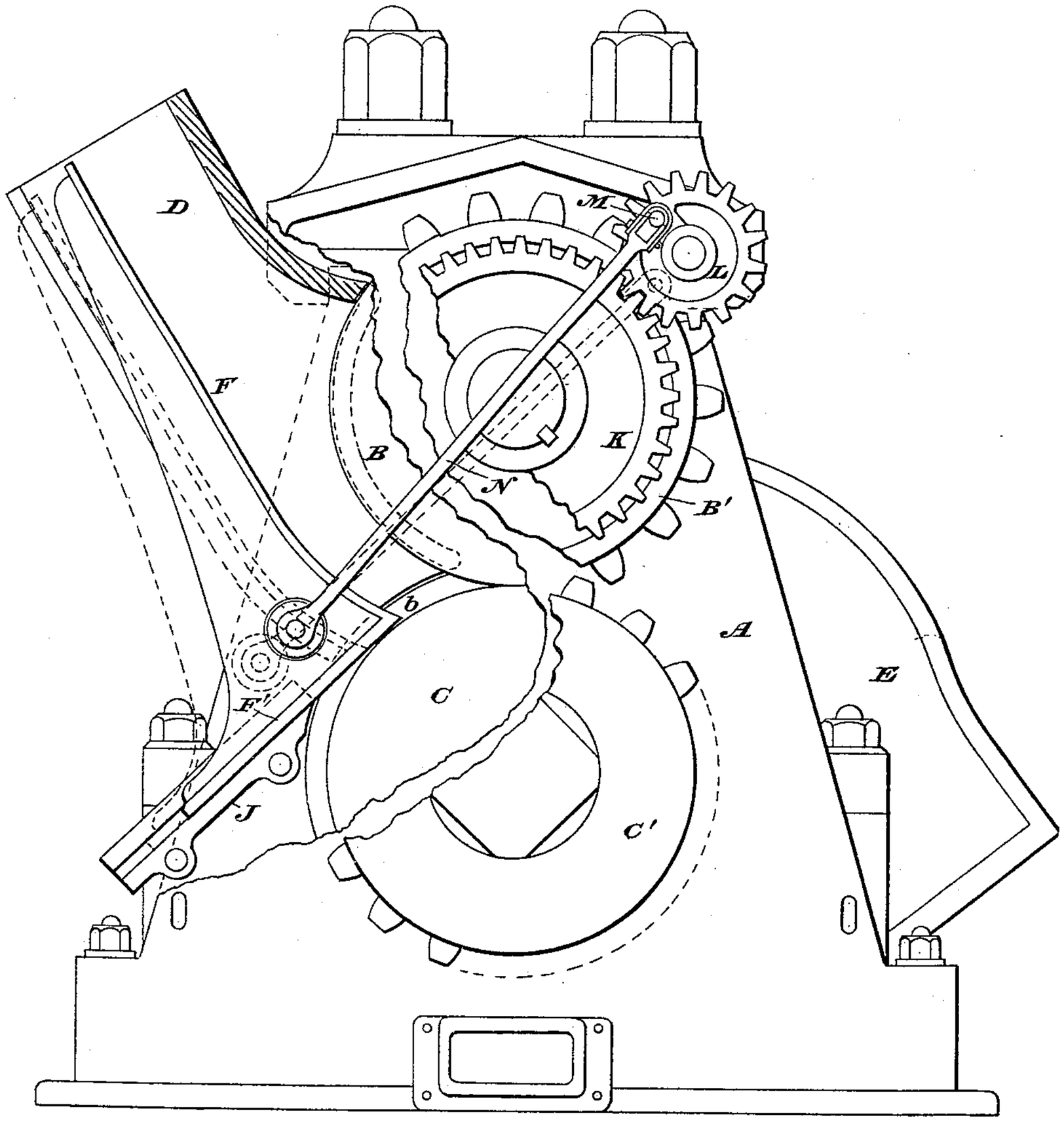
Fig. 2.



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UNITED STATES PATENT OFFICE.

ALEXANDER YOUNG, OF HONOLULU, HAWAII.

MEANS FOR FEEDING BAGASSE TO ROLLER-MILLS.

SPECIFICATION forming part of Letters Patent No. 362,810, dated May 10, 1887.

Application filed March 11, 1886. Serial No. 194,895. (No model.) Patented in Hawaii June 1, 1885, No. 26.

To all whom it may concern:

Be it known that I, ALEXANDER YOUNG, a subject of the Queen of Great Britain, and a resident of Honolulu, in the Hawaiian Islands, have invented certain Improvements in Means for Feeding Bagasse to Roller-Mills, (which invention has been patented in the Hawaiian Islands by Patent No. 26, dated June 1, 1885,) of which the following is a specification.

My invention relates to the automatic feeding and regulation of the feed of bagasse and other similar material to the rolls of the mill, whereby the feed is rendered positive and uniform, whether the material be wet or dry, or whether it be fed in large or small quantities.

My invention aims to provide a feeding mechanism by means of which the bagasse shall be pressed forward into the receiving-gap between the rolls, held there a moment until the rolls bite on it, and then released, these movements being repeated at frequent intervals while the rolls are in motion. This mode of feeding prevents the rolls from rejecting the bagasse and prevents the latter from falling away from the rolls entirely.

The essential feature of the mechanism I employ for effecting this automatic feed and feed-regulation consists of a moving feed-plate or carrier, which stands somewhat in a radial position with respect to the lower roll and at a suitable incline. This feed-plate is arranged at the bottom or lower side of the feed-chute and under the bagasse, and it is given, by suitable mechanism, an upward and downward reciprocating movement, whereby its forward end presses the bagasse upward and forward into the gap between the rollers, holds it there for a moment, and then falls back to take another purchase or hold. I have usually constructed this feed-plate to form the bottom of the feed-chute and hinged it at its outer end to the sides of the chute, leaving its inner end to play up and down; and I have usually employed as a mechanism for imparting an upward movement to the free end of the feed-plate a lever acted upon by the teeth of the gear-wheel on the lower roll; but other similar constructions and operative mechanism may be employed as well.

In order that my invention may be the better understood, reference may be had to the accompanying drawings, wherein—

Figure 1 is an end elevation of a bagasse-mill provided with my improvements. In this view I have shown the side of the feed-chute removed and a part of the frame and the gears and rolls broken away the better to show the construction and operation of the feed-plate. Fig. 2 is a view of a similar nature, illustrating a modification of the feed-plate and the mechanism for operating it.

Let A represent the end frame of the mill, B the upper roll, B′ its gear-wheel, C the lower roll, and C′ its gear-wheel, which intermeshes with wheel B′.

D is the feed-chute, which is shown as standing at about the usual inclination, and E is the delivery-chute.

F is the feed-plate, which extends the entire width of the chute D, and forms, or may form, a bottom therefor. This feed-plate is hinged or pivoted at *a*, usually on a rod extending across the chute from side to side, as represented, and it stands, normally, as seen in full lines in Fig. 1, its lower end, *b*, standing quite close to the periphery of the lower roll, C. In this arrangement of the hinging-axis *a* of the feed-plate with respect to the axis of the rolls, if the plate F be pressed upward, its free end *b* will be advanced obliquely into the receiving-gap between the rolls and upward toward the upper roll, as indicated in the dotted lines in Fig. 1, which represent the plate in its elevated position.

As a mechanism for moving the feed-plate F up and down, I mount in bearings in the main frame A a rock-shaft, G, and to this shaft I affix an arm, H, the upper or free end, *c*, of which takes under the feed-plate F, as shown. On the shaft G, in the same plane as the gear-wheel C′ on the lower roll, I fix also an arm, I, which is provided with a V-shaped projection, *d*, upon which the teeth *e e* of the said wheel act when the wheel rotates. As the wheel revolves in the direction of the arrow, one of its teeth *e* takes under the projection *d* and presses back arm I, thus rotating shaft G and causing arm H to press upward the feed-plate F. This action of the plate forces the bagasse forward into the "bite" of the rolls, and at the same time presses it against the upper roll. The bagasse is thus held for a moment while the tooth *e* of wheel C′ is passing the projection *d*. When it has

passed the apex of projection *d*, the latter moves forward into the space between the teeth to the position seen in full lines in Fig. 1, the return movement being effected by the weight of the feed-plate bearing on the end of arm H. Thus every passing tooth *e* of wheel C′ effects a reciprocating movement of the feed-plate F. When the plate falls back or recedes, the bagasse falls back with it, and at the next upward movement of the plate is again fed forward into the bite of the rolls.

I employ the teeth of the wheel C′ as a cam or cam device for actuating the feed-plate; but it will be obvious that a cam might be affixed to the roller-axis and operate on the projection *d* in the same manner as the teeth of the wheel C′. Instead of being hinged at one end, as seen in Fig. 1, the plate F might be mounted in guides and arranged to move obliquely up and down, whereby the entire plate would move in substantially the same direction as that in which the free end *c* of said plate moves in the construction shown in Fig. 1.

In Fig. 2 I have shown a modification of my machine which embodies the same principles as that in Fig. 1, but wherein the plate F moves bodily in guides, and the movement is effected through the medium of a crank driven from a spur-wheel on the axis of the upper roll, B, and a connecting-rod which is coupled to the plate F.

F represents the feed-plate provided with a base, F′, and mounted to play or move in guides J, which may be secured to the main frame of the mill. K is a spur-wheel fixed on the prolongation of the axis of the upper roll, B, and L is a pinion in mesh with wheel K, and rotatively mounted on a stud projecting from the main frame. This pinion carries a crank-pin, M, to which is coupled one end of a connecting-rod, N, the other end of which is coupled to a stud on the base F′ of the feed-plate. Rotation of crank M effects the reciprocation of the feed-plate.

I have shown two arrangements of the feed-plate and two mechanisms for operating it; but I wish it understood that I do not limit myself to these precise means for actuating the plate, nor to imparting the motion to it from the rolls. It might be actuated from some other source; but I find this the most convenient. It is important that the feed-plate, at its end nearest the rolls, shall move upward and inward toward the point where the rollers bite on the bagasse and then move back again; but the kind of mechanism employed for effecting this movement is not essential, and the number of reciprocating movements of the feed-plate during a revolution of the roll may be varied.

I have shown the end *b* of the feed-plate curved upward slightly, and I prefer this form; but I do not limit myself to any particular form, so long as it effects the purpose sought, which is to press or crowd the bagasse forward to the action of the rolls, and to hold it up for a moment until the rollers can get a firm bite on it.

I find that the uniform and positive character of the feeding by my improved mechanism results in a more thorough grinding or crushing of the bagasse, and in a more nearly equalized strain on the rolls and frame of the mill than where the material is fed in the usual manner.

Having thus described my invention, what I claim is—

1. The combination, with the rolls of the mill and the feeding-chute, of the feed-plate mounted in said chute, substantially as described, and means for imparting motion to said feed-plate.

2. The combination, with the rolls and feeding-chute, of the movable feed-plate adapted to be moved forward into and backward out from the feeding-gap of the rolls alternately, and suitable mechanism for imparting said movements to said plate.

3. The combination, with the rolls and feeding-chute of the mill, of the feed-plate arranged at the bottom of the feed-chute and hinged at its outer end, and mechanism for imparting a vibratory motion to said plate at its free end, whereby its forward end is caused to move obliquely upward and forward into the feeding-gap of the rolls, substantially as set forth.

4. The combination, with the rolls of the mill and the feeding-chute, of the movable feed-plate arranged with respect to the chute and rolls, substantially as set forth, the oscillating shaft G and its arms H and I, the latter provided with a projection, *d*, and the toothed wheel C′, whereby an intermittent movement is imparted to the said feed-plate.

5. The combination, with the rolls of the mill and the feeding-chute, of the feed-plate F, hinged at its upper end at *a*, and its free end *b* arranged with respect to the rolls, substantially as set forth, the rock-shaft G, the arm H, attached to said shaft and its free end taking behind the feed-plate, and means, substantially as described, for imparting oscillations to the shaft G, whereby the feed-plate is caused to reciprocate.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ALEXANDER YOUNG.

Witnesses:

JONA. AUSTIN,

J. M. KANEAKUA.