Nov. 12, 1929. W. G. HALL 1,735,389

CANE SHREDDING AND FEEDING MECHANISM

Filed April 20, 1928

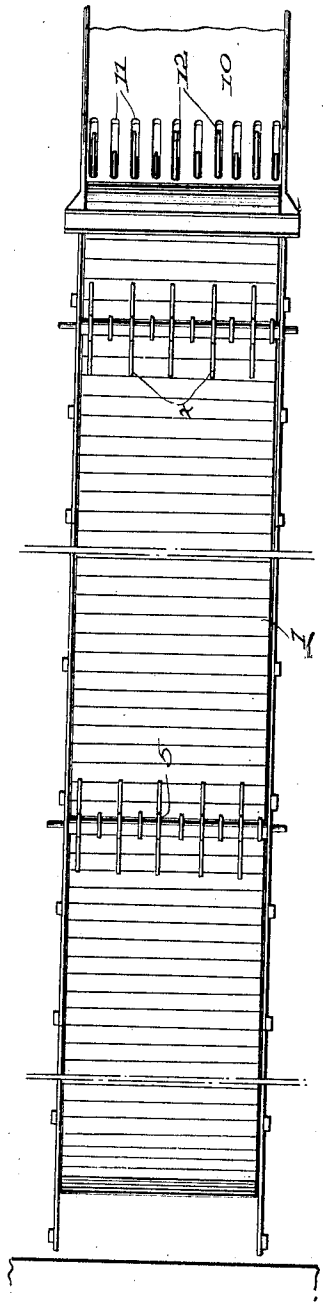


Fig. 1.

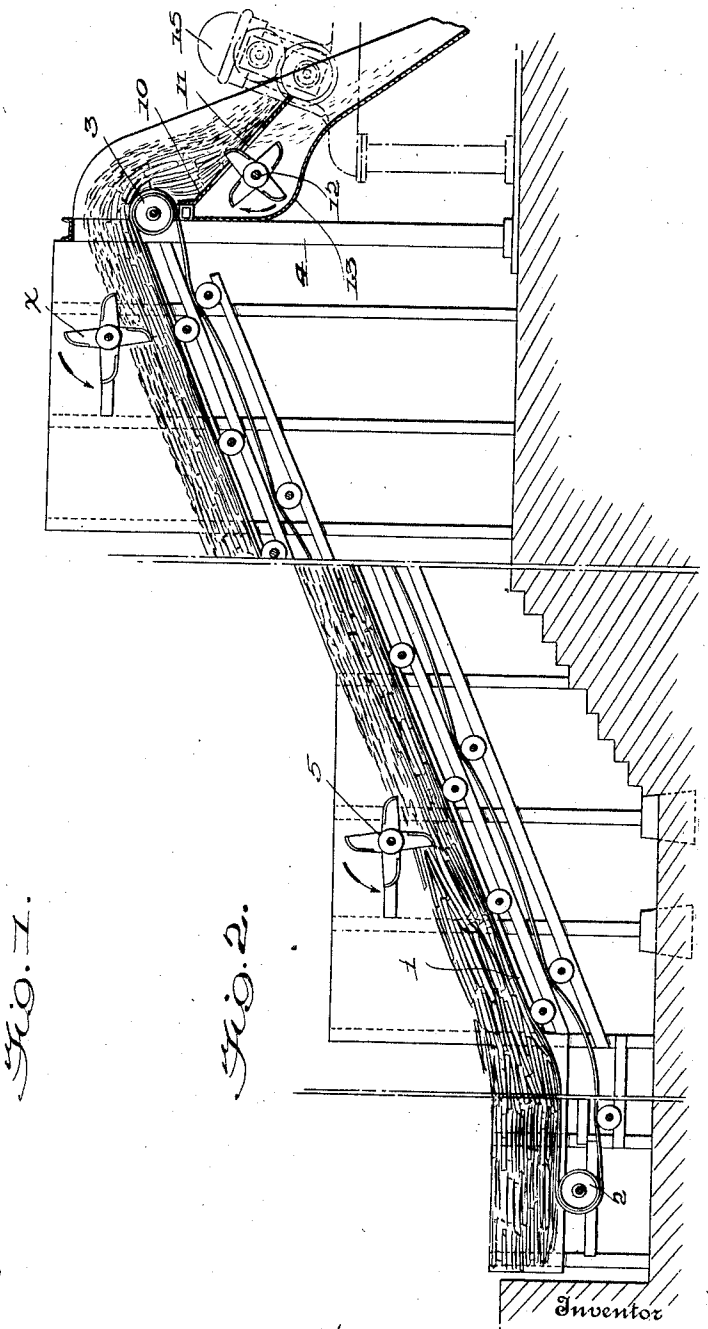


Fig. 2.

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Patented Nov. 12, 1929

1,735,389

UNITED STATES PATENT OFFICE

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CANE SHREDDING AND FEEDING MECHANISM

Application filed April 20, 1928. Serial No. 271,611.

The invention relates to a novel arrangement of mechanism for feeding sugar cane to the initial mill unit and simultaneously shredding or comminuting the cane by means of rotary cutters, to facilitate the crushing of the cane and the extraction of the juice therefrom in the various mill units, the invention involving the application of a gang of rotary cutters above the feeding carrier or conveyor, which cutters operate downward through the body of cane on the carrier, and the application of a second gang of rotary cutters between the discharge end of the carrier and the crusher or first mill unit, and preferably operating through the bottom of a chute disposed in this interval, and, therefore, operating upwardly into the body of cane, the particular relation of the two sets or gangs of rotary cutters insuring the effective shredding or comminuting of all of the elements of the cane by operating upon the body of the cane from above and below.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a plan view of the apparatus.

Fig. 2 is a sectional side elevation of the same.

Referring to the drawings, 1 indicates the usual type of cane carrier, which receives the cane from the cars at low level and elevates the same to a position where it is discharged into the crusher or other initial mill unit, the carrier consisting of an endless flight, usually of cross slats mounted upon side chains or belts operating over guide sheaves or rolls 2 and 3 at the opposite ends of the flight, the element 3 being mounted upon a head shaft supported in elevated position by means of a frame 4.

It is usual in the practice of milling sugar cane to provide rotary knives or cutters which operate on the cane as it is conveyed by the carrier to the crushing units. The main object in cutting or shredding the cane is to insure a better feed for the mill, especially for the first mill unit. The cane carrier, as described, usually consists of a horizontal section located below the ground level onto which the cane is unloaded from the cane cars, and an inclined section which carries the cane up high enough to be discharged into a chute leading to the crusher or other primary mill unit. It is customary to use one or two sets of revolving knives or rotary cutters disposed transversely of the cane carrier, the first gang being located near the ground level shortly after the carrier leaves the horizontal. This set of knives breaks down and levels the cane in the carrier, so that, although the cane is usually from four to five feet deep on the carrier before it reaches these knives, after passing the latter it has been leveled and condensed by the cutting and shredding action, so that the depth of the cane on the carrier will be two feet or less. This first gang of cutters is usually so set that the points of the revolving knives are about twelve inches above the upper surface of the cane carrier. In many cases, a second set or gang of rotary cutters is located farther up and near the head shaft of the carrier, this set being so placed that the points of the knives approach within a relatively short distance of the upper surface of the carrier. The principal object of this second set of shredding cutters is to insure all of the cane being cut into small pieces, as this latter condition is necessary to an effective operation of the crushing units of the mill in extracting the juice. It will be apparent that this second set of knives requires considerable more power to operate them than the first set, as it must cut through a denser mass or mat of cane on the carrier. It will also be apparent that, inasmuch as neither of the sets of rotary cutters actually operates in the plane of the upper reach of the carrier, the elements of the cane in immediate contact with the upper surface of the carrier may not be operated upon by the cutters. The conventional location and arrangement of the two sets or gangs of rotary cutters above the carrier is illustrated at 5 and x in the drawings, 5 being the rotary cutters near the receiving end of the carrier and x being the gang near the top of the carrier, the cutters being of conventional form and comprising a series of knives mounted on rotary shafts disposed transversely of the carrier, so that the revolving knives exercise

a cutting or chopping action on the cane as the latter is advanced by the carrier.

The present invention insures that all of the cane will be operated upon by the cutters, and enables the second or upper set of cutters x above the carrier to be dispensed with, if desired, thereby avoiding the expenditure of a large amount of power to drive these cutters through the heavy body of cane.

Disposed between the upper or delivery end of the carrier 1 is a chute 10, which may be mounted on the carrier frame 4, which chute directs the cane from the carrier into the first mill unit, usually the crusher 15. The bottom of the chute is provided with a series of longitudinal slots 11 through which the knives of a rotary cutter or shredder 12 operate, said rotary cutter being of the same general type as that shown at 5, and preferably being adjustable with respect to the chute, so that the ends of the knives may be projected upwardly into the cane on the chute to any predetermined extent necessary to insure all of the cane being operated upon by one or the other sets or gangs of cutters. The rotary cutter 12 is enclosed in a housing 13, which also serves as a means for collecting any bits of cane which may pass through the slots 11, and direct the same into the receptacle for the juice from the crusher unit 15. As indicated, the arrangement and disposition of the rotary cutter 12 will admit of the upper rotary cutter being dispensed with, if desired, but, under certain circumstances, it may be of advantage to employ the several sets of cutters 5, x and 12, as shown. It will be understood, however, that the distance which the individual knives of the cutter 12 project through the bottom of the chute 10 will be determined by the depth to which the initial cutter 5 extends into the body of cane on the carrier. In any case, the adjustment of the respective cutters relative to the upper surface of the carrier 1 and the upper surface of the chute 10 is such as to insure all of the elements of the cane being operated upon by one or the other of the rotary cutting and shredding means.

What I claim is:

1. A cane shredding and feeding mechanism comprising a conveyor, rotary shredding knives mounted above the conveyor and operating downwardly into the cane on the latter, a chute receiving the cane from the conveyor, and rotary shredding knives mounted below the chute and operating through the bottom of the latter and upwardly into the cane.

2. A cane shredding and feeding mechanism comprising a conveyor, a gang of rotary shredding knives mounted transversely of and above the conveyor and operating downwardly into the cane in the latter, a chute receiving the cane from the conveyor and having a slotted bottom, and a gang of rotary shredding knives journaled below and transversely of the chute and operating through the slots in the chute and upwardly into the cane.

3. A cane shredding and feeding mechanism comprising a conveyor, a gang of rotary shredding knives mounted transversely of and above the conveyor and operating downwardly into the cane in the latter, a chute receiving the cane from the conveyor and having a slotted bottom, a gang of rotary shredding knives journaled below and transversely of the chute and operating through the slots in the chute and upwardly into the cane, and a housing enclosing the latter gang of cutters to receive any material passing through the slots in the chute.

In testimony whereof I affix my signature.

WILLIAM G. HALL.