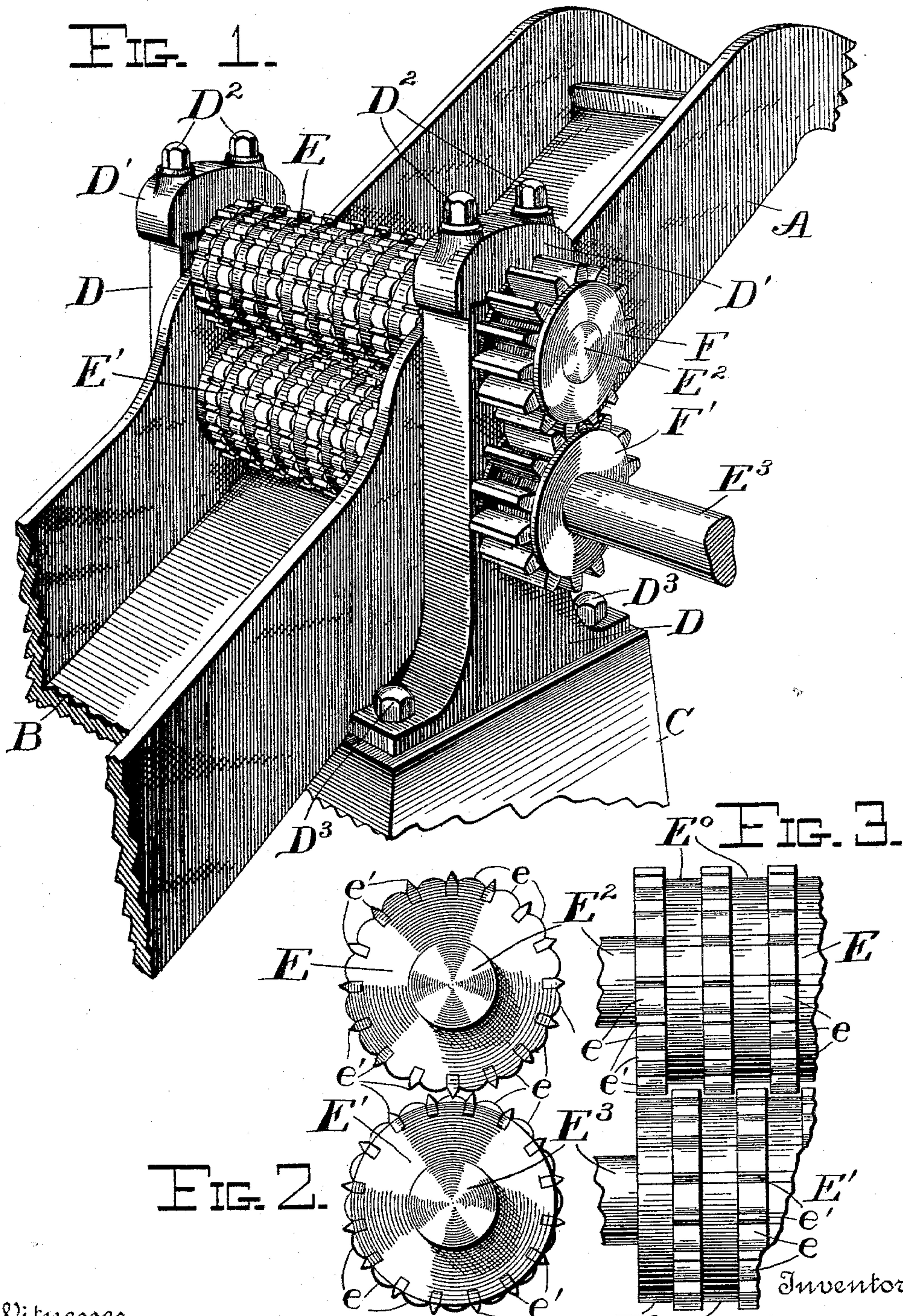


(No Model)

A. L. MARSHALL.
CANE CRUSHER.

No. 584,183.

Patented June 8, 1897.



Witnesses

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UNITED STATES PATENT OFFICE.

ALBERT L. MARSHALL, OF NEW ORLEANS, LOUISIANA.

CANE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 584,183, dated June 8, 1897.

Application filed March 18, 1897. Serial No. 628,194. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. MARSHALL, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Cane-Crushers; 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.

My invention relates to improvements in cane-crushers or apparatus for use in macerating, lacerating, crushing, and partly compressing the cane as it passes through the cane-carrier or feed-apron. The old practice of feeding the cane directly from the carrier to the mill has been found to be unsatisfactory, resulting in an unequal compression and failure to extract from the cane a sufficiently high percentage of the juice therein contained. All bagasse after coming from a mill is found to contain more or less saccharine matter, and it is purposed to make the percentage of this saccharine matter remaining in the bagasse as low as possible. This is in a large measure accomplished by the proper maceration, crushing, and partial compression of the cane before it goes to the mill proper. Various apparatuses have been devised for in part accomplishing this purpose, such as are shown in the patents to Faure, No. 250,720, to Ferron, No. 279,235, to Hungerford, No. 346,817, to Krajewski, No. 346,817, and to others; and my invention consists of certain means in which the operation of macerating, lacerating, and partially compressing the cane-juice before it reaches the mill is obtained.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a perspective view of my improved cane-crusher mounted between a cane-carrier and the mill. Fig. 2 represents an end view of the two crushing-rollers as detached from the housing and showing the two rollers in their relative positions. Fig. 3 represents a side view of the rollers as seen from the right of Fig. 2.

A represents the chute leading from the cane-carrier, which carrier is not shown, and

B represents the chute leading from the cane-crusher to the mill, the mill itself not being shown.

C represents any suitable form of foundation, on which the housings D are mounted. These housings are secured to the said foundation by means of the bolts D^2 and D^3 , which latter pass down through the caps D' , holding down the upper roller. These caps D' may be given a suitable play by means of the hydraulic mechanism now commonly in use or by any other convenient means, but this means, not being a part of my present invention, will not be further described.

E and E' represent the crushing-rollers mounted upon the shafts E^2 and E^3 , respectively. These shafts carry the gear-wheels F and F', as shown in Fig. 1, and motion is transmitted to the two rollers by suitable mechanism (not shown) and driving either one of the shafts E^2 or E^3 , but preferably the shaft E^3 , which is shown extended and broken off in Fig. 1.

The surface of the rollers E and E' is provided with a plurality of annular rows of teeth e and e' , of which the teeth e are preferably rounded to press the cane, while the teeth e' are preferably sharp to cut into and lacerate the cane. These annular rows of teeth are separated from each other by the cylindrical portions E^0 , of less diameter than the said teeth, and the two rollers are arranged so that the teeth of one roller project in toward the cylindrical portions of the other roller, but the teeth of one roller should preferably not touch the shell of the opposite roller. Moreover, there should be a slight distance between the ends of the teeth of one roller and the ends of the teeth of the opposite roller, so that these teeth may not jam or may not shear the cane too fine. Moreover, some little lateral play of the teeth must be provided for, owing to the great pressure to which the teeth would frequently be exposed.

In the operation of the device the sharp teeth cut into the cane and lacerate the same, tearing the fibers from each other longitudinally and at the same time breaking up the stalks, while the rounded teeth e press on the cane and compress it between them and the cylindrical portions of the opposite roller, thus extracting a considerable portion of the

juice before the crushed product is fed to the mill proper.

The shell of the roller, with the teeth projecting therefrom, may be cast in one, if desired, but since the sharp teeth *e'* are liable to be broken off, while the rounded teeth *e* would stand all pressure to which they are subjected, it might be preferable to make the teeth *e'* as constituting the projecting portions of serrated strips inlaid in the roller, but detachably held therein. Then when one or more of these teeth were broken it would be possible to remove the strips and insert a new strip, if desired; or, if desired, the teeth portion and cylindrical portion of the rollers might be built up of a number of rings detachably connected to the shaft in any convenient way, so that one or more of these rings could be slipped off for purposes of repair when desired.

It will be obvious that various modifications in the herein-described apparatus might be made which could be used without departing from the spirit of my invention. Thus the teeth on each annular row may be set at an angle with the elements of the cylindrical portion of the roller, or other changes might be made.

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

1. A cane-crusher, consisting essentially of a plurality of rollers provided with interpenetrating teeth, every alternate tooth being rounded on its face and the intervening teeth being more or less sharp, with means for driving said rollers, substantially as described. 35

2. A cane-crusher consisting essentially of a plurality of rollers each provided with annular rows of teeth with intervening annular grooves, the teeth of each row being alternately rounded and more or less sharp, and the teeth of one roller projecting into the grooves of the adjacent roller, with means for driving said rollers, substantially as described. 45

3. A cane-crusher consisting essentially of a pair of rollers, each provided with annular rows of teeth with intervening short cylindrical surfaces, forming with the ends of the teeth annular grooves, the teeth of each row being alternately rounded and more or less sharp, and the teeth of one roller projecting into the grooves of the adjacent roller, with means for driving said rollers, substantially as described. 55

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

ALBERT L. MARSHALL. [L. S.]

Witnesses:

ANDREW HERO,
JNO. J. WARD.