L. G. G. DIBBETS.

CRUSHING ROLL.

APPLICATION FILED FEB. 2, 1916.

**1,219,927.** Patented Mar. 20, 1917.

Fig. 1.

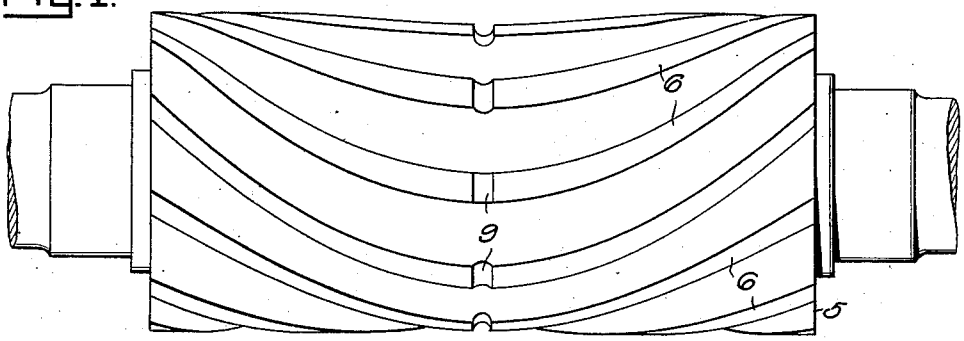



Fig. 2.

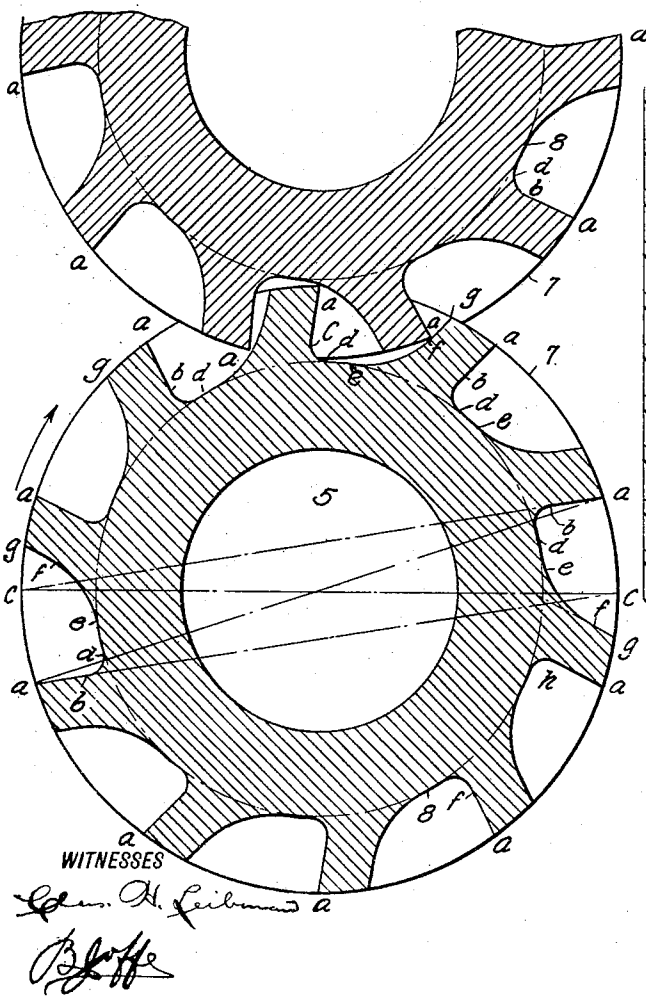
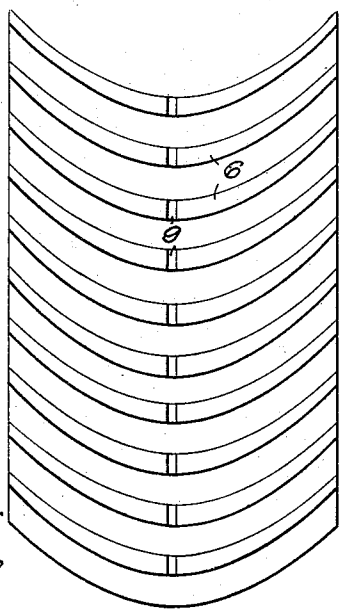



Fig. 3.




WITNESSES

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

LAURENT G. G. DIBBETS, OF THE HAGUE, NETHERLANDS.

## CRUSHING-ROLL.

1,219,927. Specification of Letters Patent. Patented Mar. 20, 1917.

Application filed February 2, 1916. Serial No. 75,700.

*To all whom it may concern:*

Be it known that I, LAURENT G. G. DIBBETS, a subject of the Queen of the Netherlands, and a resident of The Hague, Kingdom of the Netherlands, have invented new and Improved Crushing-Rolls, of which the following is a full, clear, and exact description.

My invention relates to crushing rolls for sugar-cane mills, and the object thereof is to provide simple, strong and efficient rolls having concavo-convex teeth extending across the cylindrical surface. A further object of the invention is to provide crushing rolls the teeth of which may be sharpened without removing the rolls from the crushing mill. A still further object of the invention is to provide crushing rolls having teeth so designed that the maximum strength of the teeth is in the central part of the roll.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts as herein fully described, illustrated and claimed. In the accompanying drawings, forming part of the application, similar characters of reference indicate corresponding parts in all the views.

Figure 1 is an elevation of a crushing roll embodying my invention;

Fig. 2 is an enlarged fragmentary cross section through a roll shown in coöperation with a similar roll; and

Fig. 3 is a diagrammatic view showing the development of the cylindrical surface of my crushing roll.

It is a well known fact that the efficiency of crushing rolls decreases materially as soon as the edges of the teeth on the rolls become blunt, and in consequence the teeth fail to grip and do not draw the cane between the rolls for crushing as intended. This failure of the rolls to grip and carry the cane tends to an accumulation or jamming of the cane in front of the rolls. To obviate the above defects and to allow the teeth to continue to grip after they have become blunt I have so designed the teeth of my rolls that the attacking surface thereof is depressed or rearward of the radial line drawn to the attacking edge of the corresponding tooth.

Referring to the drawings, the roll 5 on its surface is provided with longitudinally arched teeth 6 each presenting a concave and a convex side, the curvature of each side being that of a parabola the axes of which coincide, and in consequence of which the teeth are thicker in the middle than at the ends. This is a great advantage, as the feeding of cane is heaviest at the central part of the roll, consequently it is of advantage to have the teeth stronger in the central part of the roll. The teeth 6 on the roll are pitched forward in the direction of rotation of the roll, and this is obtained by depressing the attacking side *a*—*b* of each tooth from the radial line passing through the attacking edge of the tooth.

The teeth are determined as follows:—The outer circle 7 of the roll is divided into an equal number of parts *a*—*a*, depending on the number of teeth to be formed on the roll, which is preferably an even number, the point *a* of each division representing the attacking edge of the tooth. To determine the attacking side, each of the divisions *a*—*a* is divided into two parts, as indicated by the point *c*. By joining the point *c* of one division with the point *a* of the diametrically opposite divisions *a*—*a* by a straight line the direction of the attacking side is determined. The depth of the teeth is determined by a circle 8, and the portion of the teeth between the attacking sides and the tooth bottom circle 8 is formed by a fillet *b*—*d*, *a*—*b* forming a portion of the straight line *a*—*c* which determines the attacking side *a*—*b*. The other side of the tooth from *e* to *f* is an arc of a circle, the portion *d*—*e* being part of the circle 8. The portion *f*—*g* is a line parallel to the line *a*—*b* of the same tooth. It will be noted that the tooth, although pitched forward, has its maximum strength at its base, and as seen from Fig. 2, the attacking edge of both rolls is traveling in close proximity to the circular part *e*—*f* of the tooth. It will be noted that the teeth on the upper and lower rolls are concave and convex to each other respectively.

In view of the fact that the teeth are arched and the lower part of the arch is in the central part of the roll, the juice pressed out of the cane will have a tendency to accumulate in the central arched part of the tooth, and to obviate this accumulation each tooth is provided with a cross channel or slot 9 at the central part thereof.

Due to the forward pitch of the tooth, the attacking edge thereof is always forward of the back side of the tooth, consequently the gripping action is not materially impaired by the bluntness of the attacking edge. Furthermore, the tooth can be sharpened a great number of times before the attacking side will aline with a radius of the roll passing through the attacking edge, thus the efficiency of the teeth is greatly increased due to this fact. Due to the shape of the teeth on the rolls the same can be sharpened without dismounting the crushing rolls, thereby reducing the expense of the up-keep of the mill.

I claim:

1. A roll of the class described having longitudinally arched teeth, the curves forming the arches being such that the thickness of the tooth in the central part of the arch is greater than at the ends thereof.

2. A crushing mill comprising meshing rolls each having teeth arched through the length, the curves forming the arched side of each tooth being that of a parabola with the axes thereof substantially in the transverse central plane of the roller.

3. A crushing mill comprising meshing rolls each having longitudinally arched teeth pitched toward the direction of rotation of the roll.

4. A crushing mill comprising meshing rolls each having longitudinally arched teeth, the attacking sides of said teeth receding from a radial plane drawn through the attacking edge of the teeth.

5. A crushing mill comprising meshing rolls each having teeth pitched in the direction of the roll's rotation, the sides of the teeth being arched through the length of the roll, the curvature of the sides of each tooth being that of a parabola, the axis of which is normal to the elements of the roll.

6. A crushing mill comprising meshing rolls each having longitudinally arched teeth the thickness of which is greater in the central part of the arch, said teeth having slots across the thicker part thereof forming an outlet from the space between the teeth.

In testimony whereof I have signed my name to this specification in the presence of subscribing witnesses.

LAURENT G. G. DIBBETS.

Witnesses:

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A. C. GEBBAW,
B. UHBRANT.

**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."**