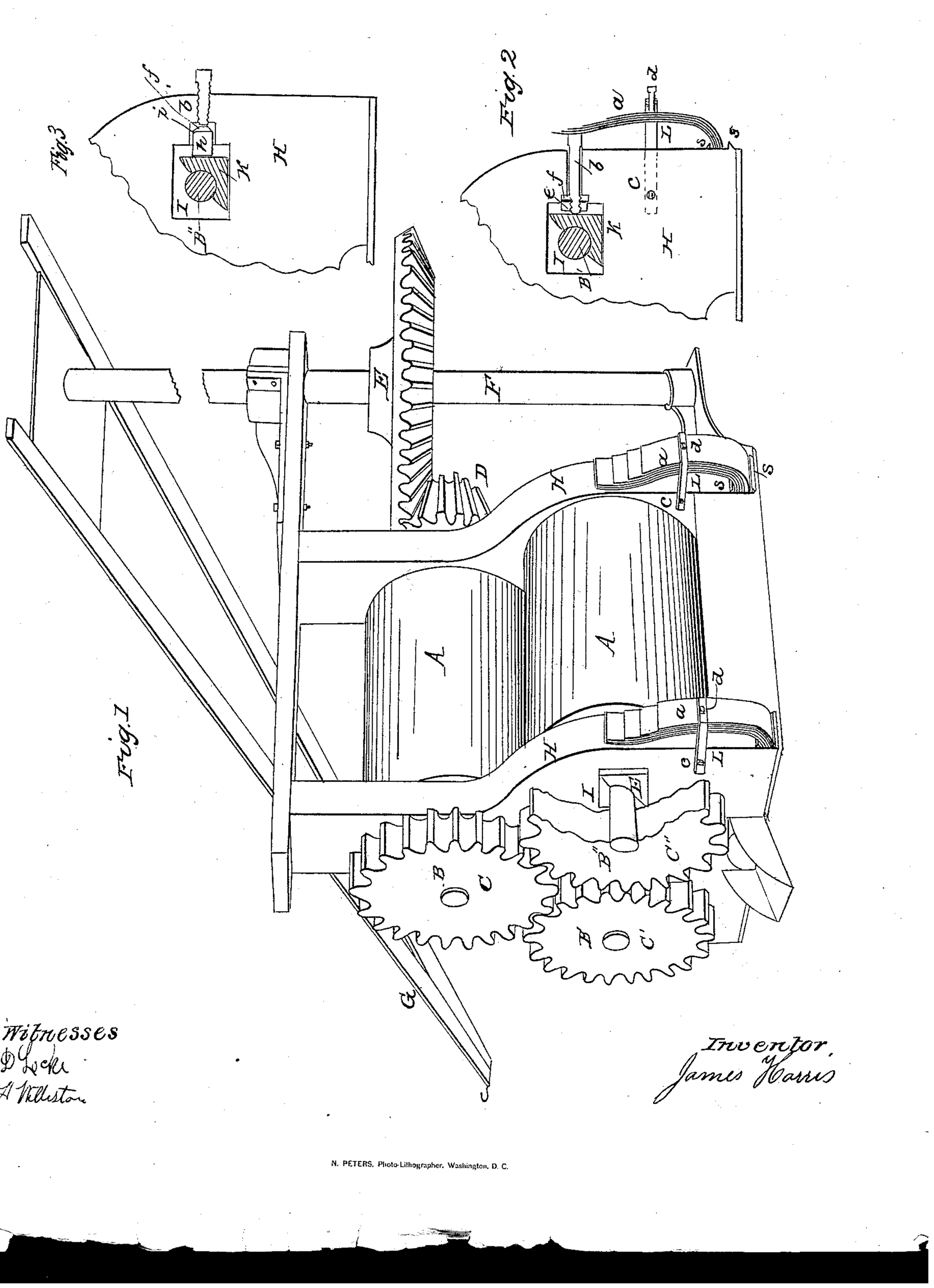
J. HARRIS.

Sugar Cane Mill.

No. 49,998. Patented Sept. 19, 1865.



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JAMES HARRIS, OF JANESVILLE, WISCONSIN.

IMPROVEMENT IN SUGAR-CANE MILLS.

Specification forming part of Letters Patent No. **49,998,** dated September 19, 1865.

To all whom it may concern:

Be it known that I, JAMES HARRIS, of the city of Janesville, county of Rock and State of Wisconsin, have invented a new and Improved Mode of Constructing and Operating a Sugar-Cane Mill; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, like characters referring to like parts in each figure.

The nature of my invention consists in making the crushing-rollers of sugar-cane mills self-adjustable by means of a spring or elastic attachment to the bearings, so as to cause a uniform pressure on the cane whether fed evenly or unevenly, and also to remove all danger or liability of breaking the mill.

My invention consists, also, in the application of chilled boxes to the bearings of sugar-cane mills for the purpose of diminishing the friction and consequent wear of the material.

To enable others skilled in the mechanic arts to construct and operate a sugar-cane mill with my improvements, I will refer to the accompanying drawings, in which—

Figure 1 is a view in perspective of a sugar-cane mill. Fig. 2 is a vertical section of a portion of the end plate of a sugar-cane mill, showing one form of the spring attachment to the bearings. Fig. 3 is the same as Fig. 2, with a modification of the spring attachment.

A, A′, and A″ are the revolving rollers or crushers, which are secured to the shafts B, B′, and B″, which take bearing in the plates H and H′. On the end of the driving-shaft B is the gear C, which meshes in the gears C′ and C″, secured respectively to the ends of the shafts B′ and B″. On the other end of the driving-shaft B is the bevel-pinion D, which is driven by the bevel-wheel E, attached to the vertical shaft F, which, in turn, is driven by the sweep G.

The spur-wheel C″, Fig. 1, is represented as partly cut away, so as to show more clearly the connection of the shaft B″ and the spring attachment.

I is an opening in the plate H, into which is housed the chilled journal-box K, which is made by pouring the molten iron directly upon an iron core, technically termed a "chill," corresponding in size to that of the bearing of the roller-shaft. The box K is sufficiently small to allow its being moved freely forward and backward in the opening I in order to adjust the roller B″ with reference to its distance from B.

The steel spring *a*, Figs. 1 and 2, which has for its fulcrum the edge of the plate H, and which is retained in its position by the projections *s* and *s*, bears on the head of the bolt *b*, Fig. 2, which passes through an orifice in the plate H and presses against the chilled box K. The spring *a* is operated and adjusted (as well as retained in position) by the yoke L, which is secured by the bolt *c* to the plate H, and through the neck of which passes the set-screw *d*, with its end pressing against the spring. The nut *e* is run up on the bolt *b*, but is not designed to be used except in case of the breaking or removal of the spring *a*, in which case, by applying a wrench to the head of the bolt *b*, the operator is enabled to run the nut *e* up the bolt until it fills the recess *f* in the plate H and presses against the plate, making the crusher or roller A″ rigid like those in common use.

Another form of the spring attachment is shown in Fig. 3, which consists simply in interposing between the regulating bolt or screw *b* and the sliding box K a cushion or pad, *h*, of rubber or other elastic material. Or the same result may be effected by a spiral spring in the place of the cushion, or by a lever operated by a spring pressing against the head of the bolt *b*. Over the end of the screw-bolt *b*, and between it and the cushion or pad, is the washer or cap *i*. The screw *b* in this figure runs in a thread in the plate H, as represented.

To operate the machine it is only necessary to apply the power to the sweep G. The cane to be crushed is inserted between the rollers A and A′ on the opposite side of the mill shown in the drawings, and passes out of the mill between the rollers A and A″. The position of the roller A″ with reference to the roller A is regulated when the steel spring *a*, Fig. 2, is used by the set-screw *d*, and when the elastic cushion is used by the screw-bolt *b*.

To make the rollers rigid like those in common use it is only necessary to remove the

springs, when the distance of the rollers A and A″ apart is easily regulated by the screw-bolt *b*. In case the steel spring is used, its removal is unnecessary.

The advantages of a mill constructed in this manner are apparent, enabling the cane to be fed far more rapidly and evenly than with the rigid roller, while at the same time there is no danger of breakage, and the pressure on the cane is more uniform, with a less outlay of power.

I am aware that sugar-cane mills have been before known and used, and I do not claim them or any part of them, except as hereinafter specified. I am also aware that hydraulic as well as weight-and-lever balances have heretofore been used to render the rollers of sugar-cane mills self-adjustable, and I do not claim them, or either of them; but

What I do claim, and for which I desire Letters Patent, is—

1. The combination of the sliding box K, bolt *b*, spring *a*, and yoke L, with the nut *e*, for the purpose of making the mill either rigid or elastic at pleasure, substantially as set forth.

2. Securing and adjusting the spring attachment of a roller-bearing by means of the yoke L and set-screw *d*, substantially as set forth.

JAMES HARRIS.

Witnesses.

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