A. STILLMAN.

Cane Mill.

No. 4,682. Patented Aug. 8, 1846.

Fig. 2

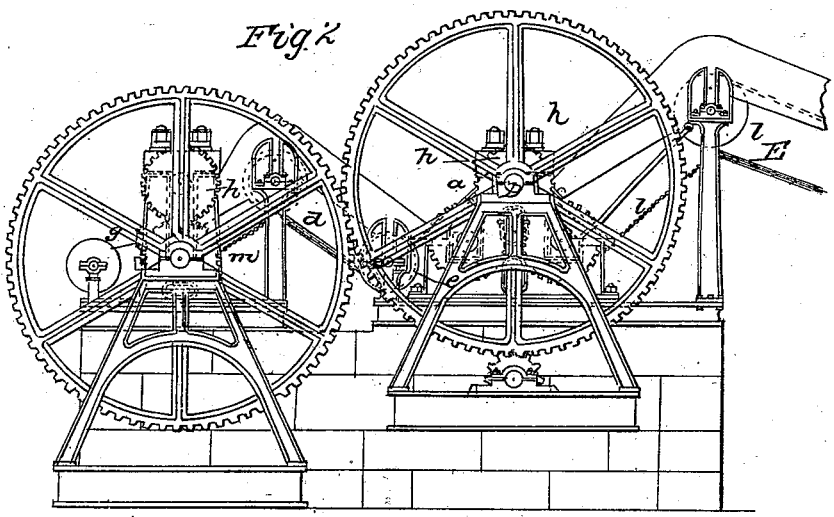


Fig. 1

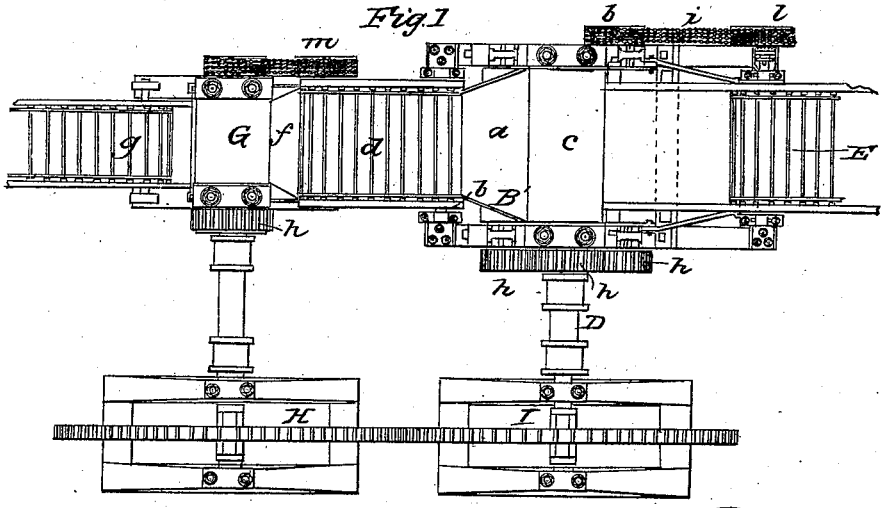
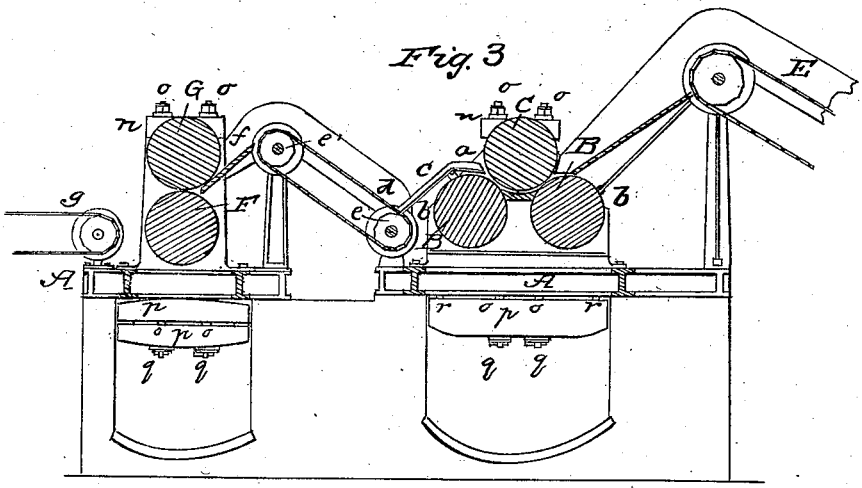


Fig. 3



UNITED STATES PATENT OFFICE.

ALFRED STILLMAN, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINERY FOR CRUSHING SUGAR-CANE.

Specification forming part of Letters Patent No. **4,682**, dated August 8, 1846.

To all whom it may concern:

Be it known that I, ALFRED STILLMAN, of the city, county, and State of New York, have invented new and useful Improvements in Mills for Crushing Sugar-Cane; and I do hereby declare that the following is a full, clear, and exact description of the principle or character thereof which distinguishes it from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of the sugar-mill with my improvements added; Fig. 2, a longitudinal elevation thereof, and Fig. 3 a longitudinal vertical section of the same.

The same letters are used in all the figures to indicate like parts.

The usual method of crushing cane is to pass it between rollers arranged with two on one horizontal plane, and a third making pressure on and between them, and as the cane is of a spongy texture the moment it is relieved from the pressure of the rollers it expands and takes up much of the saccharine matter by suction and capillary attraction, and to avoid this difficulty a second set of rollers have been combined with the first set to recrush the cane after it has passed from the first; but experience has demonstrated that this will not do, for after the cane has been crushed by passing between the first set it forms a very thin layer, which, if passed to the second set in that condition, will be ground or cut through by the pressure of the rollers, instead of being simply crushed or squeezed to throw out the saccharine matter. To obviate this difficulty is the object of my invention, which consists in so connecting the two sets of rollers as to cause the crushed cane to pass to the second set in a considerable body or thickness, to prevent the rollers from cutting or grinding it through, by so combining the two sets of rollers as that the cane shall be presented to the second set in a body much thicker than when delivered by the first set.

In the accompanying drawings, A represents the frame-work, properly adapted to the working parts and resting on a proper foundation of masonry; B B′, the two bed, and C the top, rollers composing the old sugar-mill, driven by the shaft D of the top roller, in the usual manner. As the crushed cane, which is fed in by a belt, E, passes from this first set of rollers, it is delivered onto a curved metallic plate, *a*, hung on journals in the standards *b b*, so that its forward edge shall rest on the bed-roller B′ to catch all the cane, and from this it is forced onto and down an inclined plate, *c*, the upper end of which is connected with the plate *a*, and the sides of these two plates are sufficiently high to prevent the cane from falling over them, and form a gradually-contracting passage from the roller B′ to an endless chain or apron, *d*, (that passes around two rollers, *e e′*,) which conducts it to the second set of rollers. These two plates *a* and *b* constitute what may be termed a "contracting-chute," which, as the thin cake or sheet of crushed cane passes down, narrows it up and gives to the mass the required thickness to be operated upon by the second set of rollers. This contracting-chute, instead of being made in two parts, may be made in one, as represented in Fig. 1, and hung on journals at the lower end. The thick body of crushed cane is carried up on the endless apron *d* and delivered onto an inclined chute, *f*, which directs it to the bite of the second set of rollers, consisting of a bed and top rollers, F G, driven by a cog-wheel, H, on the shaft of the bed-roller F, gearing into a corresponding cog-wheel, I, on the shaft of the upper roller, C, of the first set. From the last set of rollers the cane, thoroughly crushed and squeezed, is carried off by an apron, *g*. The rollers of each set are geared together to move with equal velocities by cog-wheels *h*, in the usual manner. The first apron, E, is carried by bands consisting of a series of endless chains, *i*, passing around and in the groove of pulleys *k* on the shaft of roller B, and a corresponding pulley, *l*, on the shaft of the roller around which the apron passes, and the apron *f* is carried in like manner by like bands, *m*, from a pulley on the shaft of the roller F.

For the purpose of making pressure on the cane as it passes between the two sets of rollers, the upper boxes, *n n n n*, of the upper rollers of the two sets are connected by means of rods *o*, that pass through holes in the frame, to springs *p*, and secured below them by wedge-keys *q* and washers, the upper ends of these rods being provided with screw-nuts.

The springs *p* are made of wood, either of

one or two pieces, and if of one piece only, the ends bear against projections *r r* on the under part of the bed-plate of the frame, and if of two, the two halves are kept at the required distance apart by pieces of wood or any other material between their ends, the upper surface of the upper half being round, to allow sufficient play to the ends.

I have contemplated other modes of applying the principle of my invention—such, for instance, as giving to the second set of rollers a motion so much less than the first set as to cause the cane in passing from the first to the second set to accumulate in sufficient quantity to pass between the rollers of the second set in a much thicker mass than when delivered from the first set; or the second set of rollers may be placed at right angles to the first set, so that what forms the width of the mass as it comes from the first set of rollers shall become the thickness between the rollers of the second set; or, instead of the inclined sides of the narrowing-chute of the mode first described, intermediate rollers may be used sufficiently far apart to narrow the mass and give the required increase of thickness for passing to the second set of crushing-rollers; but, notwithstanding the principle of my invention is susceptible of these various modifications, I deem the first mode unquestionably the best, and therefore have given a particular description of the construction and combination of its various parts.

I do not claim as my invention the combination of two sets of rollers to crush and recrush sugar-cane, as this has heretofore been essayed; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

So combining them as to present the cane, after it has been crushed by the first set of rollers, to the second set in a body much thicker than when it left the first set, the more effectually to express the saccharine matter and to prevent the second set of rollers from cutting through the mass, the whole being effected on the principle substantially as herein described.

ALFRED STILLMAN.

Witnesses:

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EDWD. C. STORM.