

I. A. HEDGES.  
Sugar Mill.

2 Sheets—Sheet 1.

No. 22,802.

Patented Feb. 1, 1859.

Fig. 1.

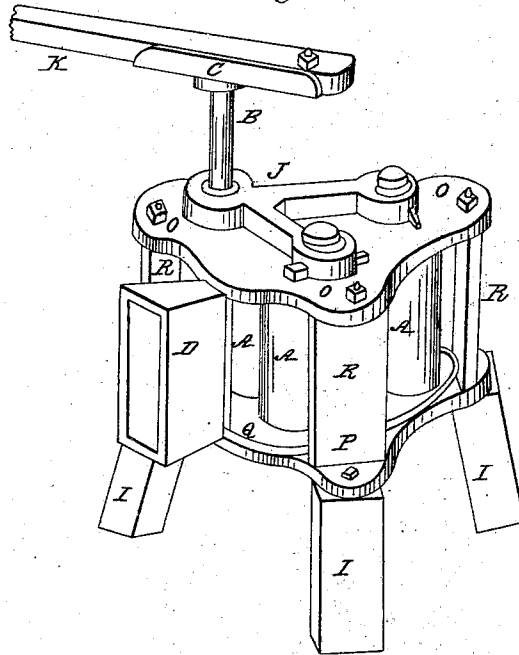


Fig. 6.

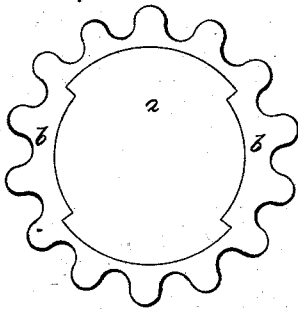


Fig. 7.

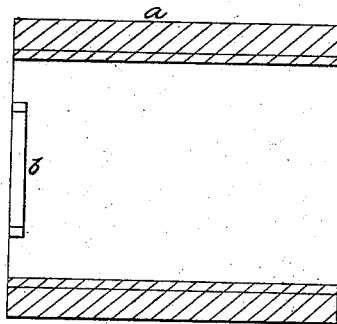


Fig. 8.

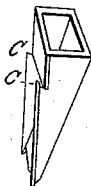


Fig. 9.

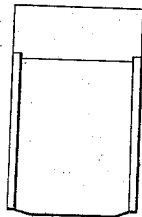
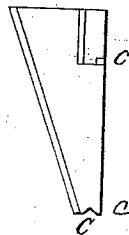


Fig. 10.



Witnesses:

W. H. Clark  
Sheldon Smith

Inventor:

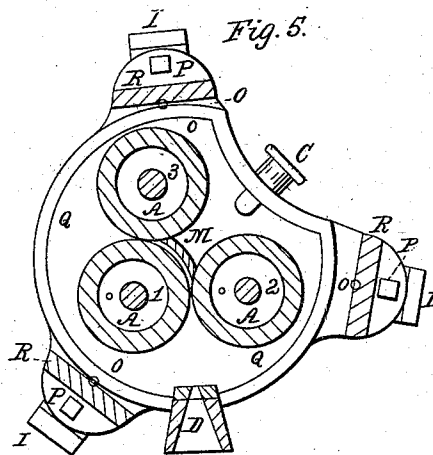
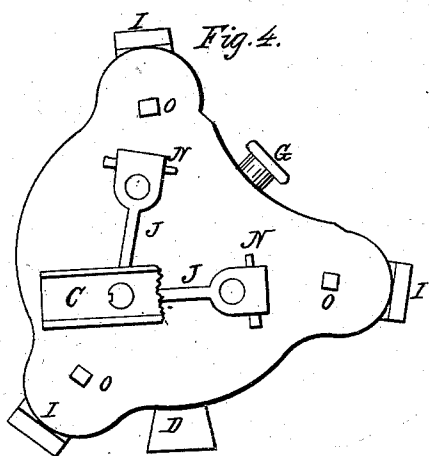
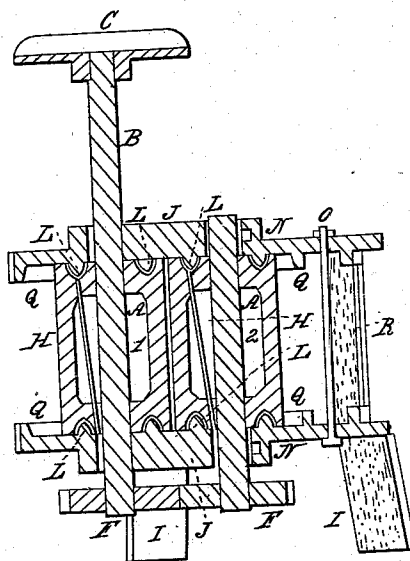
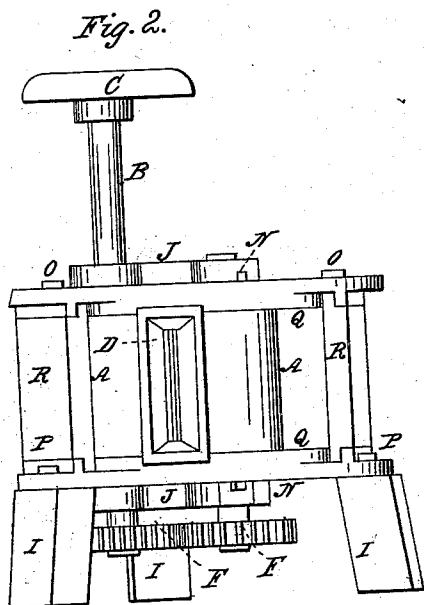
I. A. Hedges

I. A. HEDGES.  
Sugar Mill.

2 Sheets—Sheet 2.

No. 22,802.

Patented Feb. 1, 1859.



Witnesses:  
*W. H. Clark*  
*Sheldon Smith*

Inventor:  
*Isaac A. Hedges*

# UNITED STATES PATENT OFFICE.

ISAAC A. HEDGES, OF CINCINNATI, OHIO.

## IMPROVEMENT IN MILLS FOR GRINDING CANE, &c.

Specification forming part of Letters Patent No. 22,802, dated February 1, 1859.

*To all whom it may concern:*

Be it known that I, ISAAC A. HEDGES, of the city of Cincinnati, county of Hamilton, in the State of Ohio, have invented certain new and useful Improvements in Mills for Grinding and Expressing Cane; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings and letterings thereon, making a part of this specification.

My improvements consist in surrounding the openings for the roller or cylinder shafts in the upper and lower plates with annular ledges, which ledges are accommodated by corresponding recesses in either end of the rollers, while the faces of the rollers are permitted to extend downwardly and upwardly externally to the circle of the ledges to the top and bottom plates. The ledges on the bottom plate serve to stop the cane-juice from reaching and flowing out through the openings for the shafts, retaining the oil also from spreading and mixing with the juice. The ledges on the upper plate serve to prevent the oil from spreading along the lower surface of the plate to a point outside the area of the rollers and to a contact with the cane, while the recesses in the upper end of the rollers serve to contain the oil which escapes from the upper journals, permitting it to be conducted through the tube hereinafter described to the lower journals.

My second improvement consists in providing a regulator and adjuster, being an oblong throat placed longitudinally with and extending the entire length of the rollers, and of a width just sufficient to accommodate as much cane as should be permitted to be fed between the cylinders or rollers at one time. The design of this device is also to adjust the cane as it is fed in quantities through it to the mill in a vertical array or series of stalks evenly distributed through the entire length of the crushing-rollers, preventing the admission of a quantity sufficient to clog or to endanger the mill, and securing, by an even distribution of the cane over the entire length of the rollers, their uniform action and an equal pressure upon all the substance passing through them. This regulator or adjuster is used, in connection with a table of suitable height and length, to support the outer ends of the stalks while they are being carried through the regulator

to the mill, and in case the quantity presented to the rollers should at any time by enlargement become greater than can be readily drawn through the regulator some stalks will be broken off, and the amount of cane thus reduced to the proper quantity.

My third improvement consists in providing tubes for oil, passing down through appropriate openings from the recess in the top of the rollers to points of communication with the bearings below, by which the oil, after supplying the upper journals, is conducted to the journals below, and thence is permitted to distribute itself to the gearing, thus securing, by a convenient and certain process, the means of lubricating the remote and otherwise almost inaccessible parts of the apparatus.

My fourth improvement consists in adapting a pair of corrugated cylindrical shells or sleeves, so constructed in their internal and external dimensions in reference to the diameters and central distances of one pair of the crushing-rollers that they may be conveniently slipped over the latter and retained in place by corresponding lugs and recesses. The corrugated surfaces of the cylinder thus prepared match together in close proximity, and constitute, when thus arranged, a substantial, convenient, and efficient corrugated mill.

To enable persons of competent skill to make and use my invention, I proceed to describe its entire construction.

Like letters refer to like parts in all the drawings.

Figure 1 is a perspective view of the mill. Fig. 2 is an elevation. Fig. 3 is a vertical section by a plane, dividing the two front rollers through their axes. Fig. 4 is a plan of the top. Fig. 5 is a horizontal section. Figs. 6 and 7 are a plan and longitudinal section of the corrugated shells to adapt to the mill when required. Figs. 8, 9, and 10 are views of the hopper to be attached to the mill, as described, when used for that purpose.

A A A are rollers of any suitable length or diameter, made of cast-iron and turned.

B is the main shaft.

C is the flanged center, carrying the sweep.

D is the regulator and adjuster.

F F are the gear-wheels.

G is the spout for conducting off the juice.

H H are the oil-tubes leading from the recesses in the upper ends of the rollers, where

the waste oil from the upper bearings is collected, and conducting it to the journals and gearing below.

I I I are the legs or standards, made of heavy timber, to which the lower plate of the mill is securely bolted.

K is the sweep, fitted between the flanges of the center and secured to it by one or more bolts.

L L are the ledges surrounding the openings in the top and bottom plates, and accommodated by corresponding recesses in the ends of the rollers.

M is the scraper and conductor, by which the partially-compressed cane is separated from the right-hand roller and conducted around, so as to enter between the main and the rear rollers. These are keyed somewhat closer together than the former, and subject the cane to the final process of compressing.

N N N are keys by which the rollers are brought to any required proximity and held in place. The keys act in appropriate openings and against the backs of the bearing-boxes.

O O O are bolts, by which the top and bottom plates are held together.

P P P are bolts by which the mill is secured firmly to the legs or standards.

Q are the flanges, retaining the juice until it may be conducted off into vessels by the spout G.

R R R are frame-pieces placed between the top and bottom plates, furnishing a resistance to the action of the bolts o o o and giving stability and stiffness to the mill.

The opening or throat through the regulator and adjuster is made of cast-iron, which is secured to the main or wooden part by screws. It is also constructed with an exterior recess at the top and bottom, adapted to the flanges Q, and the plates of the mill being bolted together, with the regulator and adjuster in its place, the flanges enter these recesses and hold it firmly in position.

When the mill is required to be used for grinding with the corrugated cylinders, the rollers are to be all removed, and two of them clothed with the corrugated shells. These shells fit perfectly, the lugs *b* in the ends of the shells falling into corresponding recesses in the ends of the rollers. The two rollers are then returned to the mill—the main roller to position 2 and the other roller to position of roller 3, the third roller being left out. The corrugated shells will then be found to match together. The hopper is then placed in position over the spout, when, by lugs at top and bottom corresponding to ledges Q and similar to the recesses in the regulator and adjuster, it is held by closing up of the top and bottom plates firmly in place.

Having thus fully described my mode of constructing a sugar-mill, which, in its principal features, corresponds with mills for similar purposes in common use, and which features are therefore not new or patentable, what I claim as my invention, and desire to secure by Letters Patent, is—

1. Surrounding the openings in the top and bottom plates with annular ledges L, when employed in connection with rollers having recesses corresponding with them in their top and bottom ends, substantially as described.

2. The regulator and adjuster, substantially as and for the purposes described.

3. The oil-tubes H when used in connection with a recess containing waste oil to conduct the same through the rollers to the bearings below.

4. The corrugated shells, in combination with the rollers, for the purpose of readily converting the mill into a corrugated mill, constructed and adapted substantially as set forth.

ISAAC A. HEDGES.

Witnesses:

W. H. CLARK,  
SHELDON SMITH.