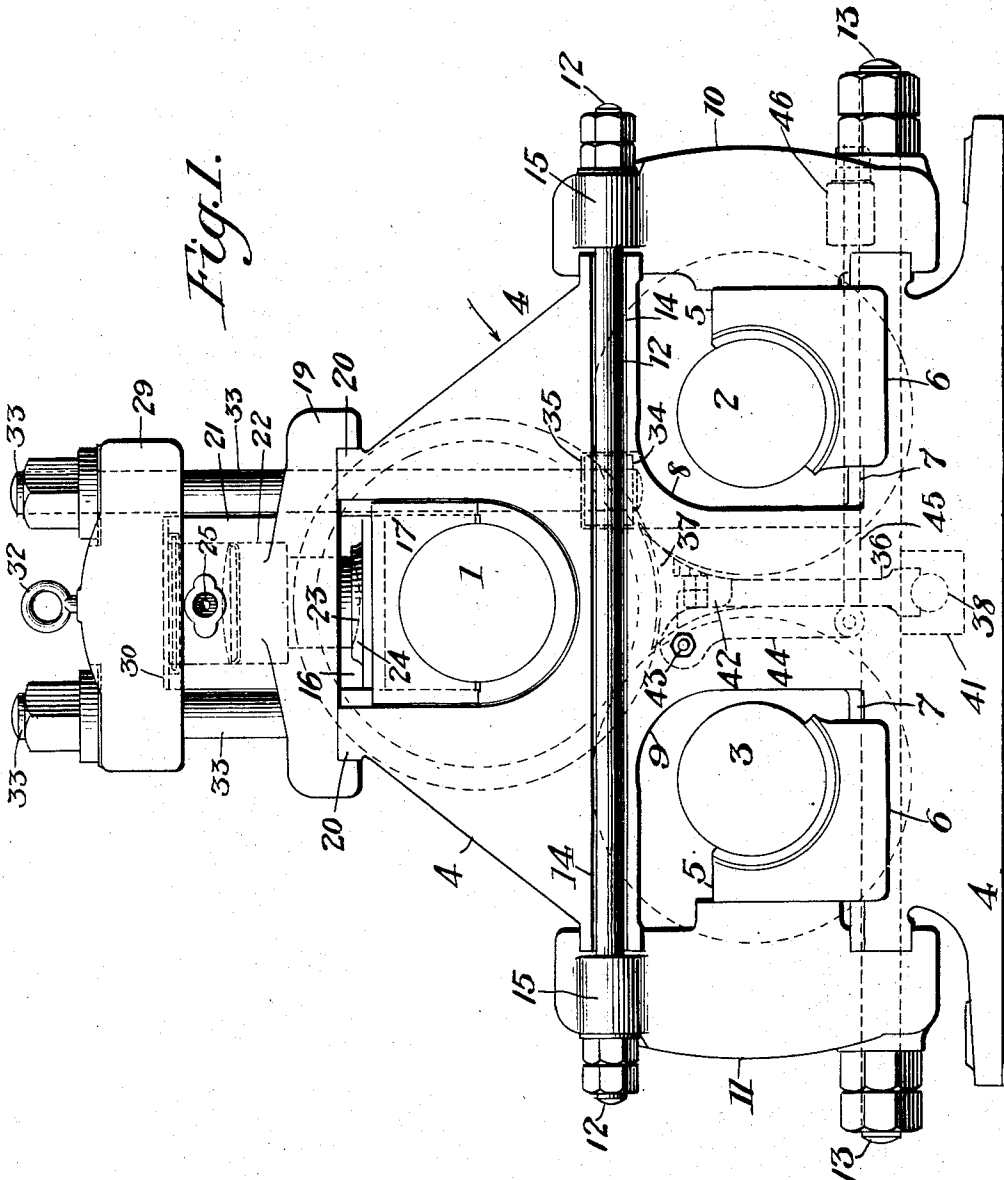


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SUGAR CANE MILL.
APPLICATION FILED JUNE 19, 1911.

1,021,829.

Patented Apr. 2, 1912.

2 SHEETS—SHEET 1.



Witnesses.
D. A. Edlin.
R. C. Smith.

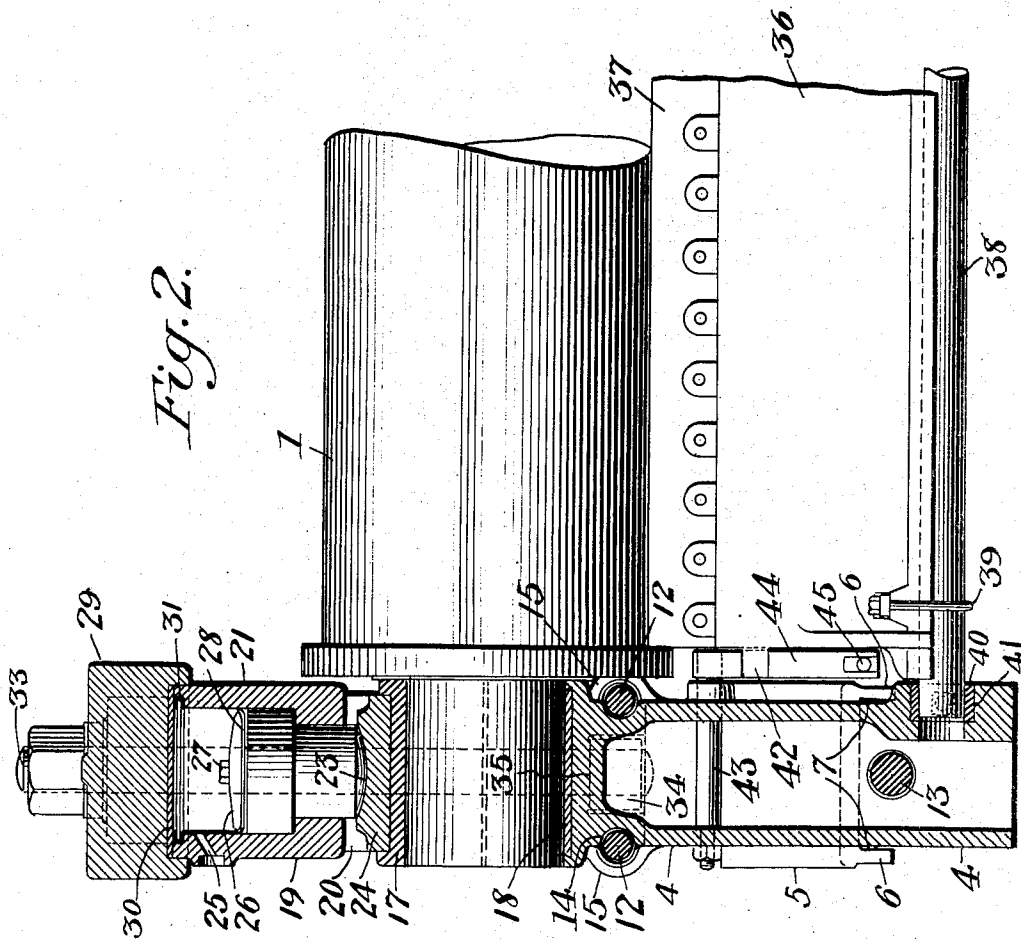
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[Signature]

Inventor.
William J. Dyer
A. F. Ewart
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UNITED STATES PATENT OFFICE.

WILLIAM JOHN DYER AND ARTHUR FREDRICK EWART, OF HONOLULU, TERRITORY OF HAWAII, ASSIGNORS TO HONOLULU IRON WORKS COMPANY, OF HONOLULU, TERRITORY OF HAWAII, A CORPORATION OF THE TERRITORY OF HAWAII.

SUGAR-CANE MILL.

1,021,829.

Specification of Letters Patent.

Patented Apr. 2, 1912.

Application filed June 19, 1911. Serial No. 633,987.

To all whom it may concern:

Be it known that we, WILLIAM JOHN DYER, a citizen of the United States, and ARTHUR F. EWART, a citizen of the British Empire, both residing at Honolulu, county of Honolulu, Territory of Hawaii, have invented certain new and useful Improvements in Sugar-Cane Mills; and we 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.

Our invention relates to sugar-cane mills and particularly to an improved type of housing for three roller mills; and it has for its objects, to reduce to a minimum the distance between the centers of the lower rollers, to permit the journals of the upper roller to be of a larger diameter than heretofore, to apply hydraulic jacks to the upper roller and provide easy access to same for repairs such as the renewal of a crimp, and to provide for adjustment of the return-bar blade against the feed roller.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, and illustrated in the accompanying drawings, it being understood that various changes in form, proportions, and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings, forming a part of this specification, Figure 1 represents in side elevation a sugar-cane mill embodying our improvements. Fig. 2 is a sectional elevation of a portion of same mill taken through the center of Fig. 1.

Referring to the drawings, the upper roller 1, the feed roller 2 and the discharge roller 3 are of the usual construction with their axes in triangular arrangement. The housings 4 are preferably steel castings which are bolted in the usual manner to a mill bed (not shown). The bearings 5 for the journals of the rollers 2 and 3 are of brass, gun metal or other suitable material and are provided with downwardly projecting flanges 6 adapted to straddle the facings 7 on the housing 4 below the gaps or recesses 8 and 9 in the front and rear of the housing 4 respectively. Bearing caps 10

and 11 are fitted to the front and the rear of the housing 4, and are bolted by the two tie-bolts 12 passing in horizontal grooves 14 in the housing 4 and through the lugs 15 on each side of the upper ends of said caps, and by the larger tie-bolt 13 passing through holes cored in the housing 4 and in the center of the lower ends of the caps 10 and 11. The vertical walls of the bearings 5 abut the caps 10 and 11.

When it is desired to change the opening between the upper roller 1 and either the feed roller 2 or the discharge roller 3, as for example on account of the rollers becoming smaller due to wear, the height of the roller 2 or 3 may be altered by plate shims placed on the housings 4 and under the bearings 5, the flanges 6 still engaging the facings 7 and retaining the bearings 5 in place laterally. Shims may also be introduced between the cap 10 or 11 and the front or rear ends of the housing 4 above and below the recesses 8 or 9 respectively.

The housing 4 is provided with the vertical gap or recess 16 to receive the top bearing 17 for the journal of the upper roller 1, and the lower portion 18 of the recess 16 is babbitted to suit said journal when it is in its lowest position. This top bearing is of gun metal or other suitable material and may slide vertically within the recess 16 with the movement of the roller 1.

The cap 19, preferably a steel casting, is fitted to engage the jaws 20 at the top of the housing 4. At the center of the cap 19 is a vertical cylinder 21 bored to receive the hydraulic ram 22. The cap 19 and the cylinder 21 are preferably made in one piece. The lower end 23 of the ram 22 is turned spherical to engage a corresponding concave in the top of a steel shoe 24 placed above the top of the bearing 17. The cylinder 21 is provided with a port 25 to which the pipe to the hydraulic accumulator is attached in the usual manner. The follower 26 is secured to the top of the ram 22 by the tap bolt 27 with the leather or other crimp 28 interposed.

The bridle-plate 29, which is of cast iron, is recessed to fit over the upper end of the cylinder 21, and a steel plate 30 is interposed to prevent leakage through the bridle-plate 29 from the cylinder 21, Fig. 2. A crimp 31 is employed to seal the joint be-

tween the plate 30 and the cylinder 21. An eye-bolt 32 is provided for lifting off the bridle-plate 29. The bridle-plate 29 is firmly clamped in position by the two king bolts 33, which pass through cored holes in the bridle-plate 29, the cap 19 and the housing 4. The nuts 34 on the lower ends of the king bolts 33 engage the housing 4 in the cored pockets 35 in same above the recesses 8 and 9. If preferred, a key through the housing 4 and through the lower portion of the king bolt 33 could of course be substituted for the nut 34 in a well known manner.

The returner-bar body 36, preferably a steel casting, with a renewable cast iron blade 37 bolted to the top of same, is supported upon the steel bar 38 to which it is clamped by U bolts 39. Each end of the bar 38 rests in a bearing block 40, which in turn is supported in a pocket 41 formed on the inside of the housing 4. By this arrangement, the returner bar is hingedly supported at its lower edge. A projection or lug 42 is cast at each end of the returner-bar body 36. A steel pin 43 is securely bolted through the housing 4, on which a lever 44 is fulcrumed to engage the rear of the lug 42 of the returner-bar body 36. One end of the bolt 45 is pivoted to the lower end of the lever 44 and the other end of the bolt 45 is passed through a lug 46 cast on the inside face of the cap 10 near its lower end.

It will now be noted that, as the king bolts 33 do not pass below the recesses 8 and 9, the distance between the centers of the lower rollers 2 and 3 is reduced to a minimum, and the king bolts have been separated to permit of the upper roller 1 having larger journals. Access to the inside of the cylinder 21 may be readily had by the removal of the bridle-plate 29. The object of the single tie-bolt 13, instead of two like the tie-bolts 12, is to provide room for the flanges 6 of the bearings 5.

While the housing 4, the cap 19 with the cylinder 21 are steel castings, and the king bolts 33 are of bar steel, the bridle-plate 29 is made of cast iron in order that it will be the first to break in case of any excessive strain due to an abnormal pressure on the ram 22 and thus act as a safety device, which can be renewed cheaply. The portion of the housing 4 between the recesses 8 and 9 is made fully as strong as the combined tensional strength of the two king bolts 33, as this portion of the housing 4 is in tension when the mill is in operation.

We claim:

1. In a sugar-cane mill, a housing, a cap engaging the jaws at the top of said housing and provided with a hydraulic cylinder with ram, a bridle-plate above said cylinder, and two king bolts passing through holes

in said cap and clamping said bridle-plate to the housing.

2. In a sugar-cane mill, a housing, a cap engaging the jaws at the top of said housing and provided with a hydraulic cylinder with ram, a bridle-plate above said cylinder, two king bolts clamping said bridle-plate to the housing, and a plate interposed between the cylinder and the bridle-plate.

3. In a sugar-cane mill, a housing, a cap engaging the top of the housing and provided with a hydraulic cylinder with ram, a bridle-plate above said cylinder, two king bolts clamping the bridle-plate to the housing, a plate interposed between the cylinder and bridle-plate, and a crimp for sealing the joint between said plate and cylinder.

4. In a sugar-cane mill, a cast steel housing, a cast steel cap engaging the top of said housing and provided with a hydraulic cylinder, a cast iron bridle-plate above said cylinder, and two steel bolts for clamping the bridle-plate to the housing.

5. In a sugar-cane mill, a housing, a returner-bar supported at one end in said housing and hinged at its lower edge, a lever fulcrumed on a pin through said housing and abutting said returner bar laterally, and a bolt hinged to said lever by which the lever can be adjusted to engage the end of said returner-bar to a greater or less degree.

6. In a sugar-cane mill, a housing, front and rear caps, two tie-bolts clamping the upper ends of said caps to the housing, and one tie-bolt passing through the housing and clamping the lower ends of said caps to said housing, substantially as and for the purpose described.

7. In a sugar-cane mill, a housing, a cap engaging the top of the housing and provided with a hydraulic cylinder with ram, a bridle-plate above said cylinder, two king bolts clamping said bridle-plate to the housing, front and rear caps, and three tie-bolts clamping the front and rear caps to the housing.

8. In a sugar-cane mill, a housing, a cap engaging the top of the housing and provided with a hydraulic cylinder with ram, a bridle-plate above said cylinder, two king bolts clamping said bridle-plate to the housing, a returner-bar supported at one end in said housing, a lever fulcrumed on a pin in said housing, and a bolt hinged to said lever for adjusting the pressure of said lever against the end of the returner-bar.

In testimony whereof we affix our signatures, in presence of two witnesses.

WILLIAM JOHN DYER.

ARTHUR FREDRICK EWART.

Witnesses:

ROBT. J. PRATT,

P. H. BURNETT.