

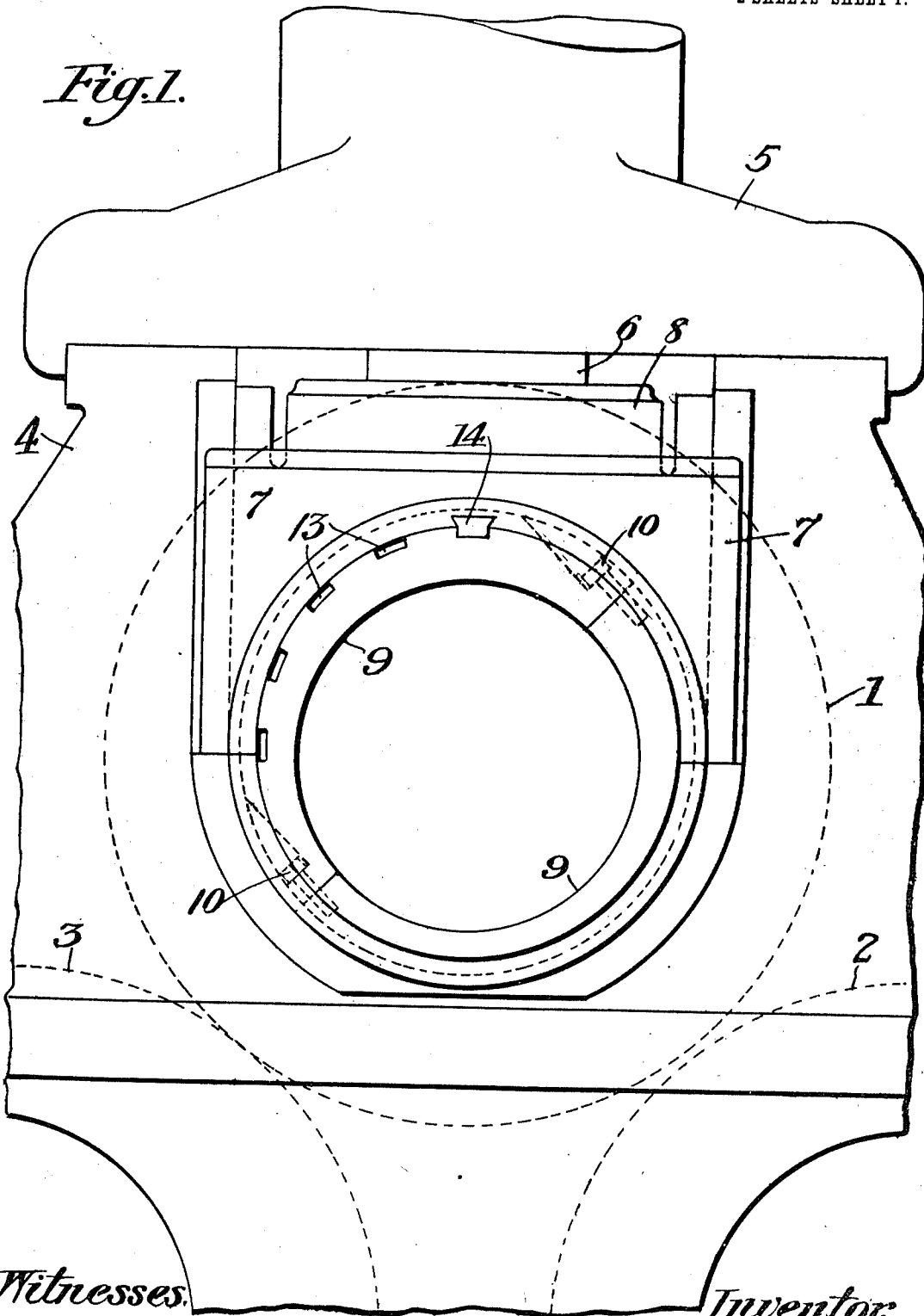
A. F. EWART.
SUGAR CANE MILL.
APPLICATION FILED NOV. 17, 1911.

1,061,535.

Patented May 13, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



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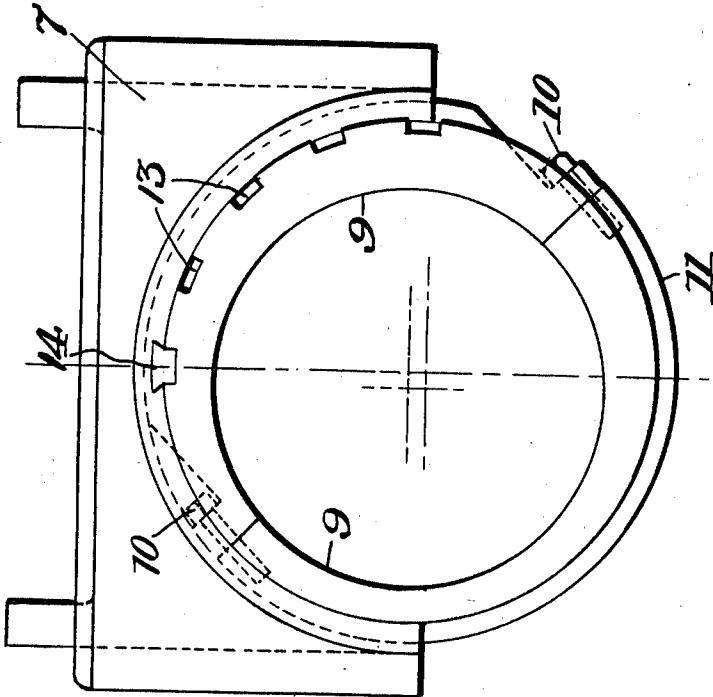


Fig. 3.

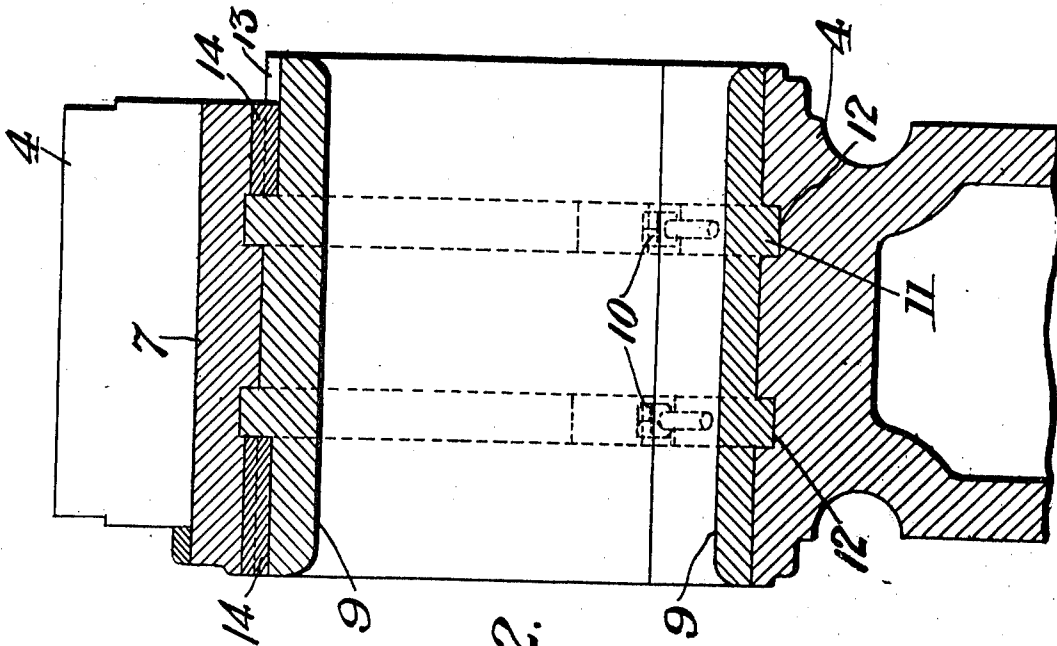


Fig. 2.

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UNITED STATES PATENT OFFICE.

ARTHUR FREDERICK EWART, OF HONOLULU, TERRITORY OF HAWAII, ASSIGNOR TO
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SUGAR-CANE MILL.

1,061,535.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed November 17, 1911. Serial No. 660,768.

To all whom it may concern:

Be it known that I, ARTHUR FREDERICK EWART, a subject of the King of Great Britain, and a resident of the city and county of Honolulu and Territory of Hawaii, have invented certain new and useful Improvements in Sugar-Cane Mills; and I 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.

This invention relates to sugar-cane mills and particularly to the bearings for the journals of the top roller of three roller mills.

It has for its object to provide bearings which will permit of adjustment of the top roller horizontally as well as vertically, such that its position may be altered in relation to the center lines of the housings and to the feed and discharge rollers respectively.

The opening between the top roller and the feed roller of sugar-cane mills is always greater than that between the top roller and the discharge roller, and the crushing strain upon the cane between the top roller and the feed roller is always less than that between the top roller and the discharge roller. In a twelve roller mill, for example, the openings between the rollers become gradually less successively in the four mills, while the pressure applied to the top rollers by the hydraulic jacks becomes greater. In view of these facts, it is desirable to be able to adjust the position of the top roller of each mill so as to cause the resultant line of force to be as nearly coincident as possible with the vertical center line of the housings.

This invention is particularly applicable to the improved type of sugar-cane mills described and claimed in an application for patent, Serial No. 633,987, filed June 19, 1911, by W. J. Dyer and myself. One reason why this invention is applicable to this type of mill is that the recess in the upper portion of the housing for the top roller bearing can be made as large as desired, for the king bolts can be separated to suit as they do not pass below the feed and discharge rollers as is customary in the usual type of mill.

The present invention consists in provid-

ing eccentric bushings for the bearings of the top roller journals, each made in two pieces for the purpose of assembling, with means for preventing lateral displacement and for securing these bushings to prevent same from turning with the roller, also for thus securing the bushings in any of various similar angular positions such that their eccentricity will alter the position of the top roller with respect to the center lines of the housings and to the feed roller and discharge roller respectively, as will hereinafter more fully appear.

In the accompanying drawings, forming a part of this specification, Figure 1 represents in side elevation a portion of a three roller sugar-cane mill embodying a preferred form of my invention. Fig. 2 is a vertical section through the center of Fig. 1. Fig. 3 is a side elevation of a top bearing and an eccentric bushing, the latter being shown turned through 90° from its position as shown in Fig. 1.

Referring to the drawings, the top roller 1, the feed roller 2 and the discharge roller 3, are of the usual construction. The housing 4 is provided with the cap 5 with a hydraulic ram 6 at its center. The top bearing 7 is adapted to slide vertically within the recess in the upper portion of the housing 4. A shoe 8 is placed above the top of the top bearing 7 and is engaged by the lower end of the ram 6.

The eccentric bushing 9, of brass, gun metal, or other suitable material, is made in two pieces fastened together by screws 10, and is adapted to encircle a journal of the top roller 1. One or two annular tongues 11 are provided on the outside of the eccentric bushing 9 near its center, and are adapted to fit in corresponding grooves 12 formed in the bottom of the top bearing 7 and in the bottom of the recess in the housing 4 respectively. The annular tongues 11 reinforce the eccentric bushing 9 and prevent its displacement laterally. The eccentric bushing 9 is also provided with a number of equally spaced keyways 13, cut between the annular tongues 11 and the ends of said bushing. Keys 14 are dovetailed or otherwise secured in the top bearing 7 on its center line between the grooves 12 and its outer and inner faces respectively, said keys being adapted to fit in any of the keyways 13

in the eccentric bushing 9 which may be selected.

It will now be noted, that when the eccentric bushing 9 is in the normal position, as shown in Fig. 1, the center of the top roller is on the center line of the housing; that when the bushing 9 has been turned to the position as shown in Fig. 3, the center of the top roller has been shifted horizontally the full amount of the eccentricity of the bushing, and at the same time this center has been raised an equal amount; and that when the bushing 9 is in any one of the intermediate positions, with the keys 14 in any of the intermediate keyways 13, the top roller is shifted both horizontally and vertically to an intermediate position between the normal and extreme positions.

In assembling, the two parts of each eccentric bushing 9 are fastened together by the screws 10 so as to encircle the journals of the top roller 1, and the roller is lowered in place in the housings 4, the annular tongues 11 fitting in the grooves 12. The top bearings 7 are next lowered in place, the eccentric bushings 9 being turned on the journals until the keys 14 enter the corresponding keyways 13 selected. When the roller 1 is raised sufficiently to take its weight off from the eccentric bushings 9, the latter may be readily turned on the journals by means of a spanner wrench applied in a keyway 13.

When it is desired to change the position of the top roller, the top bearings 7 are raised so that the keys 14 will clear the eccentric bushings 9, whereupon these bushings may be turned in the manner above described.

I claim:—

1. In a sugar-cane mill, a roller, an eccentric bushing in which the journal of the roller is mounted, a vertically movable bearing block, and means associated with said bearing block and said bushing to lock the bushing against rotation when the said block is lowered and to permit the bushing to be circumferentially shifted when said block is raised.

2. An adjustable bearing for a sugar-cane roller and the like, comprising a circumferentially shiftable bushing surrounding the journal of the roller, a vertically movable locking element adapted in the raised position to render said bushing shiftable

and when in the lowered position to lock said bushing against rotation.

3. In a sugar-cane mill, a roller, an eccentric bushing in which the roller is journaled, a vertically movable bearing, a key carried thereby and a key-way in the bushing adapted to be engaged by said key to prevent rotation of the bushing, said bushing adapted to be circumferentially adjusted when said key is removed from the key-way by raising said bearing block.

4. A bearing for rollers and the like, comprising an eccentric bushing in which the roller is journaled, a series of key-ways peripherally arranged thereon, a movable element mounted above said bushing and carrying a key adapted to engage in any of said key-ways to lock the bushing against rotation, said bushing being circumferentially adjustable when said movable element is raised to bring the proper key-way under the said key.

5. A bearing for rollers and the like, comprising an eccentric bushing provided with peripheral annular tongues to prevent lateral displacement and a series of peripherally arranged recesses, a movable top bearing having locking means to engage in said recesses to lock the bushing against rotation, said bushing being circumferentially adjustable when the top bearing is raised to disengage said locking means from said recesses.

6. In a sugar-cane mill, a roller, a housing, a top bearing slidable vertically in said housing, an eccentric bushing provided with key-ways, and a key in the top bearing, substantially as and for the purpose described.

7. An adjustable bearing for sugar-cane rollers and the like, comprising an eccentric bushing provided with a key-way on its periphery, a bearing block surrounding said bushing, and a key cooperating with said recess and said bearing block to lock the bushing against rotation, said bushing adapted to be circumferentially adjusted when said key is removed from said recess.

In testimony whereof I affix my signature, in presence of two witnesses.

ARTHUR FREDERICK EWART.

Witnesses:

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