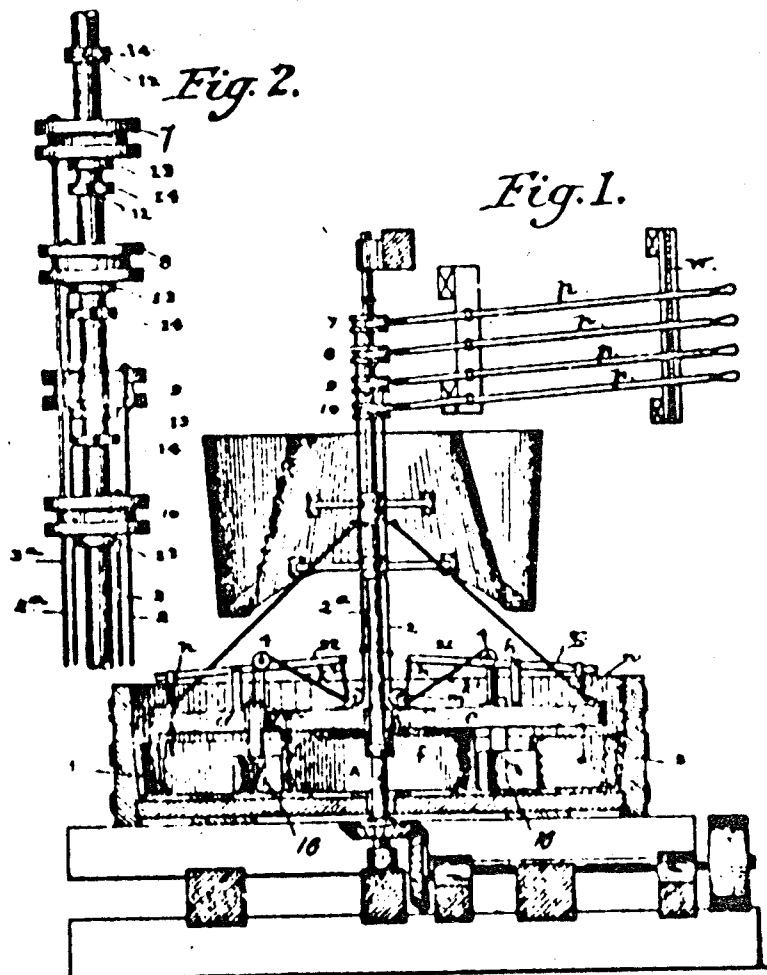


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G. A. GELIEN.
LIFTING MECHANISM FOR ROLLERS OF ORE CRUSHING PAIRS.
APPLICATION FILED NOV. 10, 1900.

1,029,863.

Patented June 18, 1912.



Witnesses:
H. S. Giel
of Regent

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by C. L. O'Brien
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1,029,863. LIFTING MECHANISM FOR MULLERS OF ORE-GRINDING PANS. GUSTAVE A. GELIEN, San Francisco, Cal. Filed Nov. 16, 1909. Serial No. 528,390.

To all whom it may concern:

Be it known that I, GUSTAVE A. GELIEN, a citizen of the United States, and a resident of the city and county of San Francisco and State of California, have invented new and useful Improvements in Lifting Mechanism for Mullers of Ore-Grinding Pans, of which the following is a specification.

This invention relates to improvements in ore grinding pans, and especially to the means for regulating or varying the contact of the grinding stones or mullers with the grinding surfaces of the pan without shutting off the power or interrupting the grinding operation; the object being chiefly to improve in several respects the means for lifting and holding the mullers at varying distances and with varying extent or degree of contact or distance from the opposing grinding surfaces of the pan.

This invention embraces several improvements in the construction and arrangement of the regulating mechanism described in and forming part of a previous invention covered by Letters Patent issued to me on the seventh day of November, 1893, No. 508,008, by which the mullers are raised from and held at one end above the bottom of the pan with a greater or less elevation, according to the conditions of the work, and as it may be desired to vary the layer or body of pulp taken under the leading end of the muller; as well as to insure an even wearing away of the grinding faces of the mullers.

This regulating mechanism for the mullers of an ore grinding pan, consists in the novel parts and combination of parts as hereinafter described and set forth in the claims at the end of this specification, reference being had to the description of the accompanying drawings:—

Figure 1 of the drawings represents in vertical section an ore grinding pan having the muller lifting mechanism of my invention embodied therein. Fig. 2 shows in detail on an enlarged scale the muller lifting mechanism and the upright shaft of the driving means.

The lifting mechanism forming the subject matter of this invention is shown and will be described herein in connection with my earlier improvements in ore-grinding pans covered by Letters Patent before mentioned to which they are especially applicable.

The pan or apparatus illustrated in the drawing is of that description, having the outer mullers S harnessed or attached to

revolving arms $d-c$ fast on the upright shaft f by which they are drawn around the shaft A with sufficient speed to throw the outer ores in contact with the sides of the pan.

In the progress of the work it becomes necessary at times to lift the nose or forward end of the muller to let the pulp pass under in greater or less quantity from time to time to be caught between and acted on by the grinding surface; and for the purpose of raising and adjusting its working position with relation to the bottom surface of the pan each muller is attached to a separate lifting mechanism the construction and arrangement of which are shown in the detail Fig. 2.

Each muller is connected to a slidable collar on the upright shaft by a connection composed partly of a flexible cord or a chain and partly of a stiff rod, having one end fastened in a slidable collar and extending therefrom perpendicularly downward, so that the pulling force or strain which is thrown on the rod by the upward movement of the collar will be substantially parallel with the shaft f ; the cord being turned and carried under and over guide pulleys on the carrying arms and downward to the mullers so as to apply the pull of the rod perpendicularly.

As arranged in Fig. 1 the outer muller S on the right is connected with the rod 2 through the medium of the lever g which is fulcrumed at h on the arm e , and from the inner end of the lever g the cord k is carried under the pulley m and up to the rod 2 to which it is fastened. The muller is attached to the outer end of the lever g by a link n . The rod 2 is carried up through an aperture in the first or lowest collar 10 to the next collar 9 in which it is fastened rigidly by nuts on the screw-threaded end of the rod. Each muller is connected in like manner separately with a collar by a stiff rod fastened rigidly at the top end in its collar, and by the cord or flexible connection between the lower end of the rod and the muller; the rods that are fastened to the upper collars being carried perpendicularly upward through the lower collars, which are apertured for that purpose. The collars are raised and lowered by means of hand-levers p having forked ends engaging the collars, and the levers are held in any desired position within the limits of the machine by a rack w so arranged as to engage the levers near the ends. Any muller or scraper 16 in the pan is readily raised or lowered by operating the particular hand-lever with which it is connected through a sliding collar and connections. The vertical movement being limited in the downward direction by the stop collars 13 fastened to the shaft prevents the collars

from being moved on the shaft to such a point that the cord connection would become loose and be liable to be unshipped from the carrying pulleys. The stop collars 14 secured to the shaft by set screws 12 limit the upward movement of the collars 7, 8, 9, 10 and regulate the length of movement. It is evident that as the mullers and scrapers 16 wear down it will not be necessary to move the collars so great a distance to raise the operative parts the desired distance from the bottom of the pan. The connection between the scrapers 16 and mullers and the collars 7, 8, 9 and 10 are so arranged that an upward movement of the collars will cause an upward movement of the operating parts, thereby placing the connections in tension as they are being regulated. This allows of the use of much lighter connecting parts than when such parts were subject to compression during their operation.

In this improvement it will be seen that the connections between the adjusting levers and the mullers or parts to be moved are made in such a straight or direct manner, that they will work without binding or excessive friction, and the parts can be set or adjusted by the exercise of a relatively small exertion of power.

I claim:—

1. In an ore grinding-pan having traveling mullers arranged for movement around an upright driving-shaft, the combination with the mullers, of a plurality of slidable collars on the shaft having limited vertical movement thereon, one over another, a rod to each collar extending vertically downward therefrom, a flexible connection between the lower end of each rod and one of the mullers, guide-pulleys arranged to carry the connection from the said rod to the muller, the rods connected to the upper collars being carried loosely through the collars below in a direction generally parallel with the shaft, fixed stops on the shaft for limiting the movement of the collars, and means attached to each collar for moving the same and thereby raising or lowering the mullers.

2. In a grinding-pan of the character described, having an upright driving shaft, a plurality of mullers arranged to travel on the bottom of the pan around the driving-shaft from which they receive their motion, of means for regulating the contact of the mullers with the bottom of the pan, comprising a plurality of slidable collars on the shaft placed one above another, adjustable stops between the collars for regulating their extent of movement, a connecting means between each collar and a particular collar composed partly of a stiff rod and partly of a flexible connection, the rod being attached directly to its collar and ex-

tending downward therefrom parallel with the shaft through all the collars below, and guide pulleys arranged between the lower end of the rod and the muller for carrying the flexible connection in proper working position to transform the perpendicular upward movement of the rod into a lifting movement of the mullers.

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Witnesses:

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