(No Model.)

J. WALKER.

CRUSHER MILL.

No. 564,039. Patented July 14, 1896.

Fig. 1.

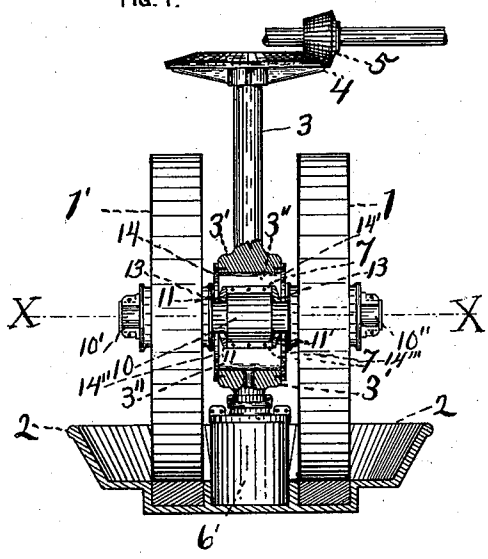


Fig. 3.

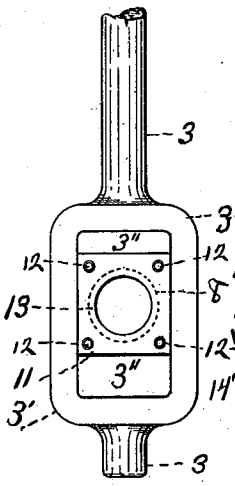


Fig. 4.

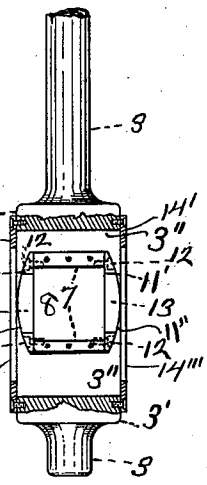


Fig. 2.

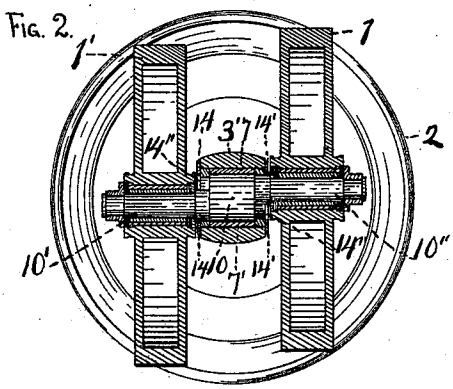


Fig. 3a.

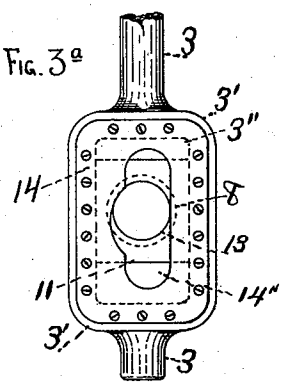


Fig. 7.

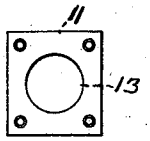


Fig. 8.

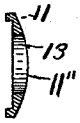




Fig. 9.

Fig. 10.

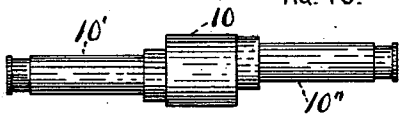


Fig. 5.

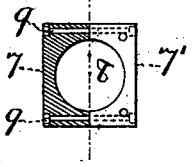
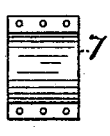


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN WALKER, OF CHICAGO, ILLINOIS.

CRUSHER-MILL.

SPECIFICATION forming part of Letters Patent No. 564,039, dated July 14, 1896.

Application filed July 25, 1894. Serial No. 518,504. (No model.)

To all whom it may concern:

Be it known that I, JOHN WALKER, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Crusher-Mills, of which the following, with the accompanying drawings, is a specification.

My invention relates to that class of crusher-mills known as "Chili" mills, in which a pair of edge-runners or vertical millstones are employed for crushing or grinding.

Heretofore in such mills the millstones have been mounted upon axles that radiate from a vertical shaft, or the axles have been secured to a crank journaled in a cross-beam attached to the vertical shaft, the axles being disposed either in line with each other and with the center of the vertical shaft or out of line with each other, so as to be offset from the center of the vertical shaft. In the use of the first form there is a great deal of strain on the axle and on the vertical shaft when one of the rollers strikes an obstruction in its travel, and in the form employing "crank-axles" the lifting of one of the rollers over an obstruction in no manner affects the opposite roller.

The object of my invention is to so improve the Chili mill that both rollers may be mounted upon a single axle adapted to have a tipping movement, so that the lifting of one roller tips the opposite roller and throws an added weight upon it without causing any strain upon the vertical shaft due to the lifting of one roller, and to leave both rollers free to lift over obstructions without the employment of cranks. With this object in view my invention consists in the construction and combination of parts described herein and defined in the claims.

In all the figures of the drawings like figures of reference refer to like parts.

Figure 1 is an end view, partly in section, of a mill embodying my invention. Fig. 2 is a cross-section of such mill on the line x x of Fig. 1. Fig. 3 is an enlarged view illustrating a side elevation of a portion of the vertical shaft containing the floating box herein described with the retaining-plate removed. Fig. 4 is an enlarged edge view of a part of the vertical shaft, partly in section. Fig. 5 is an enlarged end view, partly in section, of the floating box; and Fig. 6 is an inside view of one longitudinal section of the floating box. Fig. 7 is an enlarged elevation of one of the end plates of the floating box. Fig. 8 is a central cross-section of the same, and Fig. 9 is an edge view of said plate. Fig. 10 is an enlarged view of the axle.

1 and 1′ are the edge runners or rollers.

2 is the annular pan or trough in which the rollers travel.

3 is the vertical shaft through which power is communicated to the rollers, and 4 and 5 are gears through which power is transmitted to the shaft 3.

6 is a support for the vertical shaft 3. The vertical shaft 3 is held by the support 6 by any means which will allow the shaft to rotate freely.

In the shaft 3 is formed a rectangular enlargement 3′, through which transversely there is a rectangular opening 3″. Within the transverse opening 3″ is a floating box, which consists of the longitudinal sections 7 and 7′, which together form a rectangular box with an opening 8 therethrough. The longitudinal sections 7 and 7′ are secured together by means of bolts 9, which pass through both sections, as illustrated by Fig. 5. I employ a single axle, which has the enlarged central part 10 and the spindles 10′ and 10″, which are preferably offset from the center 10 of the axle, as illustrated. The axle is placed in the opening 8 of the floating box, the enlarged part 10 filling the opening 8 and having a rotary movement therein. The axle having been put through the floating box, as stated, the box ends 11 and 11′ are passed over the spindles 10′ and 10″ and are fastened to the ends of the body of the floating box by means of screws 12. The openings 13 of the end parts 11 and 11′ are of less diameter than the diameter of the enlarged part 10 of the axle, and prevent longitudinal movement of the axle in the floating box, while the axle may have a rotary movement therein. The axle with the floating box thereon is then put through the transverse opening 3″, and the retaining-plates 14 and 14′ are secured to the sides of the rectangular enlargement 3′ to re-

tain the floating box in the lateral opening 3″. The rollers 1 and 1′ are then mounted on the spindles 10′ and 10″.

The retaining-plates 14 and 14′ are provided with elongated openings 14″ and 14‴ to allow the axle to lift as one or both rollers pass over obstructions.

The end pieces 11 and 11′ of the floating box are made slightly rounded on their outer faces 11″, as illustrated, so that the floating box may tip with the rollers as they pass over obstructions, while the square form of the box on its sides prevents any twisting of the box within the lateral opening 3″.

It will be seen that by the use of my invention the rollers readily travel over any material in the pan; that each roller rises and falls independently of the other roller as it meets an obstruction, but that the rising of either roller tips the opposite roller, causing it to receive an added pressure through the single axle; and that both rollers, or either alone, will rise and fall according to the amount of material in the path of travel. The side tipping of the rollers on their edges, as provided for by my invention, increases their grinding and crushing power. With these additional advantages there is no side strain on the vertical shaft, while the axle is adapted to have a tipping movement, and all the advantages of crank-axles are gained.

My improvement may take on various modifications in details of construction, and I do not therefore limit myself to the construction described.

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

1. The combination, in a crusher-mill, of a vertical shaft having a transverse opening therethrough, a floating box having an opening longitudinally through it, the floating box being within the transverse opening, plates for keeping the floating box in position in said transverse opening, a single axle having a rotatable movement in the floating box, and rollers mounted upon the axle, substantially as specified.

2. The combination, in a crusher-mill, of a vertical shaft having a transverse opening therethrough, a floating box having an opening longitudinally through it, the floating box being within the transverse opening, means for keeping the floating box in position in said transverse opening, a single axle provided with spindles offset from its center and having a rotatable movement in the floating box, and rollers mounted upon said spindles, substantially as specified.

3. The combination, in a crusher-mill, of a vertical rotatable shaft having a transverse opening therethrough; a floating box having an opening longitudinally through it and provided with rounded ends, said floating box being within the transverse opening; retaining-plates having openings therethrough to hold the floating box in the said transverse opening of the vertical shaft; two edge-rollers, and a single axle upon which both rollers are mounted, substantially as specified.

4. The combination, in a crusher-mill, of a vertical rotatable shaft having a transverse opening therethrough; a floating box made of longitudinal sections and rounded end pieces and having an opening longitudinally therethrough, the floating box being within the transverse opening through the vertical shaft; retaining-plates having openings therethrough, to hold the floating box in place; two edge-rollers, and a single axle passing through the floating box and the retaining-plates, said rollers being mounted upon the ends of the axle, substantially as specified.

5. The combination, in a crusher-mill, of a vertical rotatable shaft having a transverse opening therethrough; a floating box having an opening longitudinally through it and provided with rounded ends, said floating box being within the transverse opening through the vertical shaft; retaining-plates having openings therethrough to hold the floating box in place; a single axle having spindles offset from the central part of the axle, said axle passing through the floating box and the retaining-plates, and rollers mounted upon the spindles, substantially as specified.

6. The combination, in a crusher-mill, of a vertical rotatable shaft having a transverse opening therethrough; a floating box made of longitudinal sections and rounded end pieces and having an opening therethrough, the floating box being within the transverse opening through the vertical shaft; retaining-plates having openings therethrough to hold the floating box in place; a single axle having spindles offset from its center, the axle passing through the floating box and the retaining-plates, and rollers mounted upon the spindles, substantially as specified.

In testimony whereof I affix my signature, in the presence of two witnesses, this 23d day of July, 1894.

JOHN WALKER.

Witnesses:
J. A. OSBORNE,
E. E. OSBORNE.