

J. BEALL.
MILL FOR GRINDING GRAINS.
APPLICATION FILED SEPT. 16, 1908. RENEWED MAR. 15, 1912.
1,041,950. Patented Oct. 22, 1912.

Fig 1.

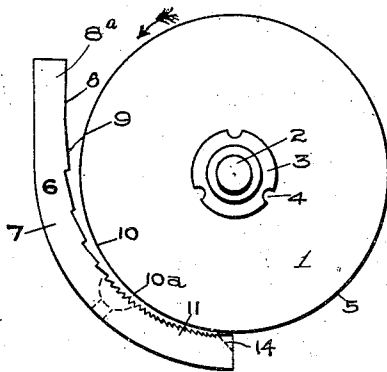


Fig 3.

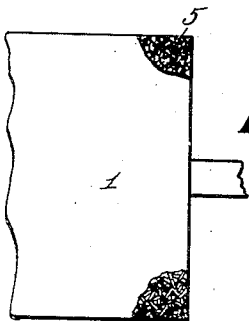
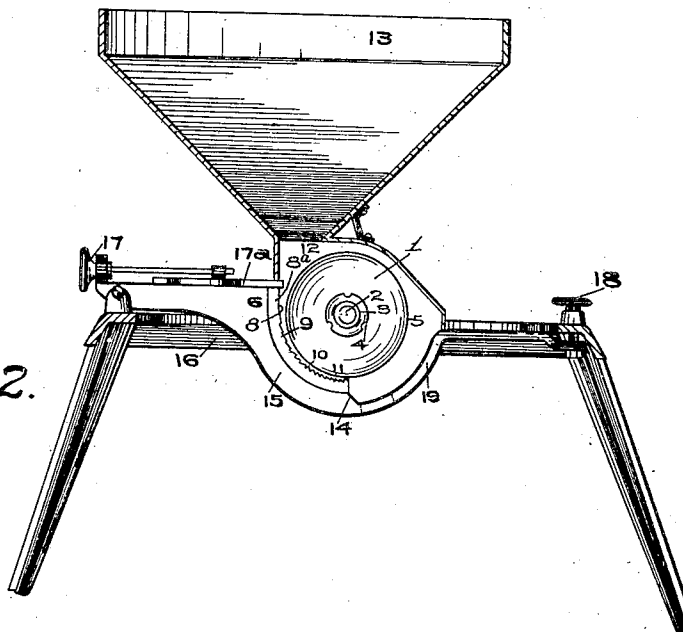


Fig 2.



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MILL FOR GRINDING GRAINS.

1,041,950.

Specification of Letters Patent.

Patented Oct. 22, 1912.

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To all whom it may concern:

Be it known that I, JOHN BEALL, a citizen of the United States, and resident of Decatur, Macon county, State of Illinois, have invented certain new and useful Improvements in Mills for Grinding Grains; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with a claim particularly specifying the novelty.

This invention relates to that type of mills which are used in the grinding of corn or oats either mixed or separated and the efficient crushing of the same. To this end the invention contemplates a simple, practical and effective construction of a grinder roller and a feed plate therefor, possessing special utility in combination with a feed for mills and the regulation of same.

With these and other objects in view, which will readily appear to those skilled in the art as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

The essential features of the invention involved is the mounting of a roller of suitable material either iron or emery on a shaft in such a manner as to prevent its movement thereon, the mounting of the shaft and roller on a standard with relation to a mill plate as to allow for the entering of the grain and forcing of the same into teeth on the plate and against the roller.

In the drawings forming a part of this specification, Figure 1 is an elevation of the grinding roller and mill-plate or concave in operative relation therewith; Fig. 2 an elevation of the grinding mill with the frame and hopper in section; and Fig. 3 is a side view of one end of the grinding roller, its irregular surface being indicated at two places thereon.

The numeral 1 represents the roller which is or may be made of any material, preferably of carborundum or emery, built on a shaft 2, said shaft 2 being provided with an enlarged portion integral therewith as 3, which runs the full length of the roller 2 and which is provided with longitudinal grooves or recesses as 4; these recesses 4 run the full length of said enlargement 3 and in the formation of the rollers thereon the material is first made to enter the grooves 4 and

thence around the enlargement 3 the grooves and said enlargement being within the roller and the same is thus prevented from rotating on the shaft and is made stationary therewith, making it possible to hold the roller against the force of grain grinding, and to adjust the other mechanisms to a fixed fineness for grinding grain.

The outer exterior surface of the roller 1 as at 5 is rough and uneven containing miscellaneous grooves, notches or depressions located at uncertain periods thereon.

A mill-plate or concave 6 having a smooth exterior surface, is mounted adjacent the roller 1 in the retainer plate 15 which it fits snugly, the inner face of the concave being eccentric to the roller and lying close to it at its lower end. The head 8^a of the concave has a smooth unbroken inner face 8, 75 which is separated a suitable distance from the roller to form an inlet mouth for grain to be ground. The inner face 8 of the head 8^a of the concave is in line with the rear outlet wall 12^a of the hopper 13 through which 80 wall projects a cut-off plate 17^a. The inner side of the concave curves from the smooth face 8 down one side and beneath the roller 1, gradually approaching the surface of the roller as stated. From the lower limit of 85 the surface 8, the inner face of the concave is provided with a number of ridges extending across the same parallel to the axis of the roller 1, decreasing in width from the head 8^a to the lower end of the 90 concave. At the upper end of the concave the ridges present a broad face to the roller, which gradually decreases in width to about a point 10^a where the sides of said ridges are of equal length, but as they approach 95 the outlet end of the concave the opposite sides of said ridges become longer and resemble saw-teeth in cross-section. As thus formed the teeth serve to crush the grain when it first enters between the roller and 100 the concave, being gradually reduced in this manner as it works its way down toward the outlet and finally coming in contact with the sharp or saw teeth 11, the reduction of the grain is finished.

In operation, the roller 1 on shaft 2 is mounted in a suitable manner as on frame 16 with a receiver hopper 13 and in conjunction therewith; the feed 12 is regulated by set screw 17 operating a bar 17^a which moves slidably on the member 15—19 which supports the mill plate 6, and the said feed mouth 12

is increased or decreased in accordance with the movement of said plate to or from the roller 1, the entrance to said plate being controlled entirely by the distance between the said roller and the slidable member 17^a taking up wear and lost motion. The tension on the roller is secured by means of a blade or member 19 onto which is placed stationary therewith, the mill plate or concave 6; said member 19 is pivotally attached to the frame 16 as at 20, and is raised and lowered by means of a set screw 18, said tension being regulated according to the distance intervening between the roller and the concavity of the mill plate 6, this increasing or decreasing of the friction governing the coarseness or fineness of the grinding, and adjusts the said plate and roller. Further, the grain, whether it be oats and corn (and applicant knows of no similar grinder that can be like effective on corn and oats) passes from the elevator into the hopper 13, thence downward through opening 12 against the roller 1 which rotates in the direction indicated by the arrow and directly against the smooth face 8 of the plate 6 by means of the wall 12^a and fills the space that then exists between said plate and roller, then passes downward along the facets to the teeth as at 9 and is there caught below the teeth where it is cracked, crushed or broken coarsely, and is then drawn down into the next succeeding tooth by the roughness of the face of the roller, and said teeth prevent-

ing the rise of the grain due to the velocity of the roller and as the teeth grow shorter and the grain is forced into them it is ground fine, is taken by the reverse teeth as 11 and then the grinding is complete. The object of the face 8 of the mill plate 6 is to allow the grain a chance to feed into the roller and teeth and be caught by the raising surface of the roller to prevent backward or upward movement, and at the same time, not retard the grain.

What I claim as new is,

A grinding machine comprising a roller having a concentric roughened peripheral surface formed by short irregularly disposed grooves and shallow depressions therein, a concave in eccentric relation to the periphery of said roller provided on its working face with a plurality of angular ridges each having a cutting edge, the cutting edges of the ridges at the upper end of the concave facing in the opposite direction to those at the lower end of the concave and intermediate ridges having their sides of equal length and inclination with respect to the axes of said ridges.

In testimony whereof, I have hereunto subscribed my signature, this 25th day of August A. D. 1908.

JOHN BEALL.

Witnesses:

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JOHN L. WADDELL.