(No Model.) 2 Sheets—Sheet 1.

U. H. ODELL.

CRUSHING ROLL.

No. 260,226. Patented June 27, 1882.

Fig. 1.

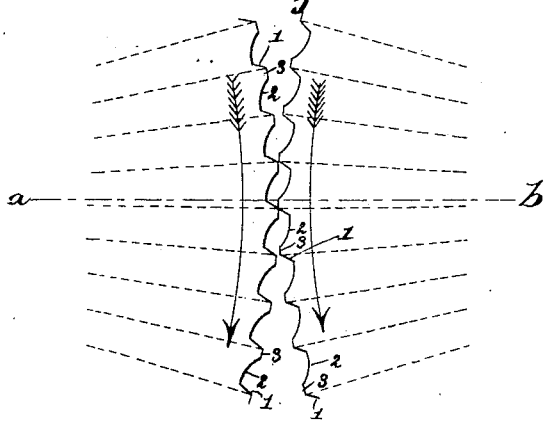


Fig. 3.

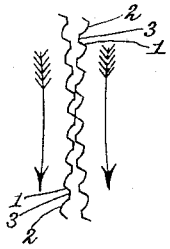


Fig. 2.

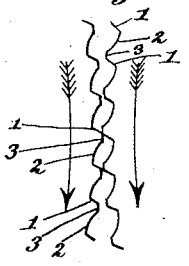


Fig. 4. *Fig. 5.* *Fig. 6* *Fig. 7.* *Fig. 8.*

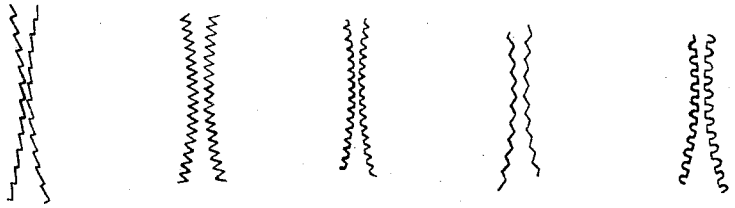
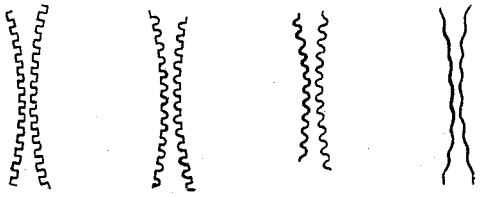


Fig. 9. *Fig. 10.* *Fig. 11.* *Fig. 12.*



Attest,
Jno. E. Wiles.
Herbert P. Cook.

Inventor,
Adolphus H. Odell.
by Wood & Boyd
his Attorneys &c.

(No Model.) 2 Sheets—Sheet 2.

U. H. ODELL.

CRUSHING ROLL.

No. 260,226. Patented June 27, 1882.

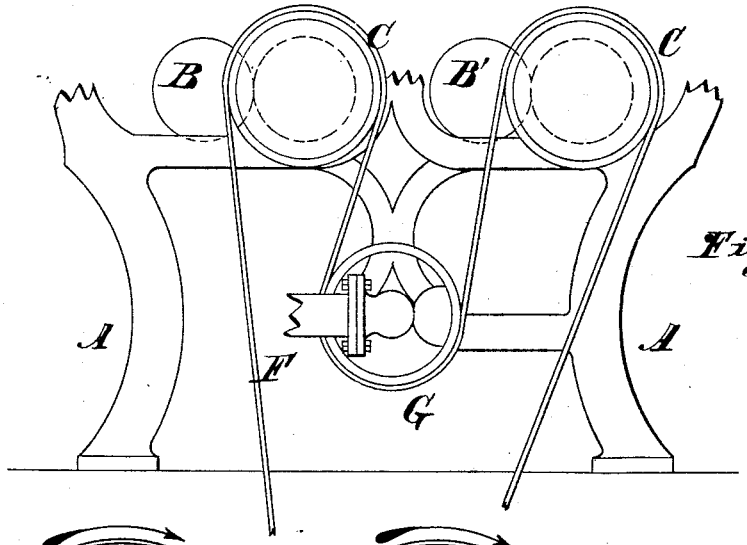


Fig. 13.

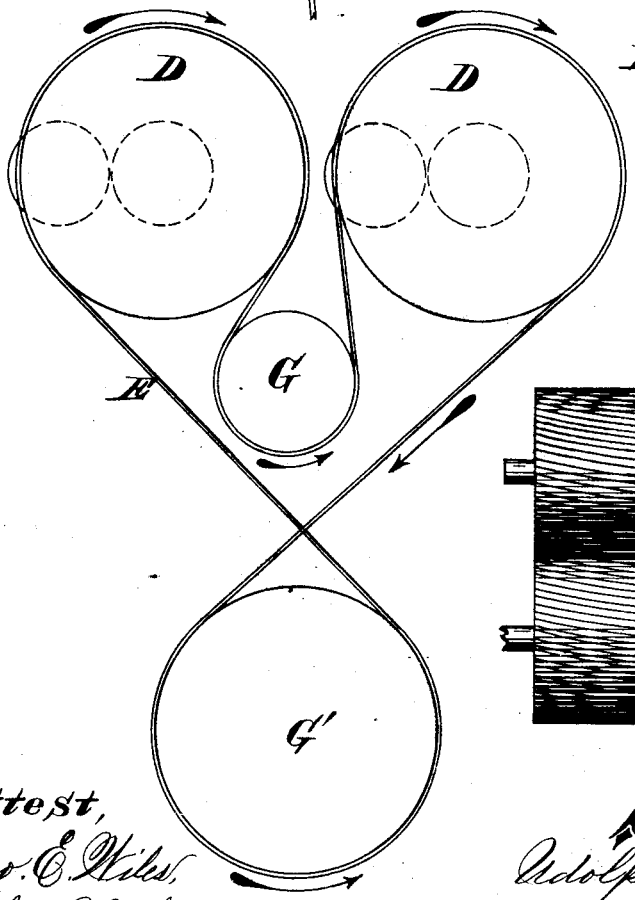
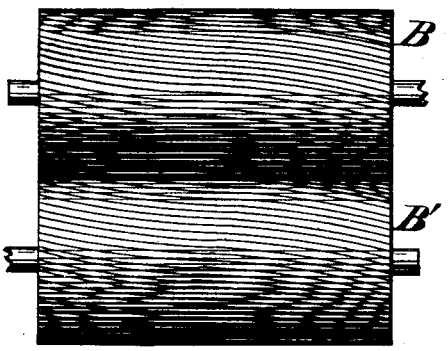


Fig. 14.

Fig. 15.



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UNITED STATES PATENT OFFICE.

UDOLPHO H. ODELL, OF DAYTON, OHIO.

CRUSHING-ROLL.

SPECIFICATION forming part of Letters Patent No. 260,226, dated June 27, 1882.

Application filed March 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, UDOLPHO H. ODELL, a citizen of the United States, and a resident of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Crushing-Rolls, of which the following is a specification.

This invention relates to an improvement in rolls for roller-mills.

My object is to so make the breaking-ribs on the faces of the rolls that the degerminating and gradual reduction process will be accomplished in a perfect manner. I make each corrugation or rib with a plane beveled surface on one side and a concave surface on the opposite side, and the front or outer edges of the ribs with a plane face curved on the circle of the rolls.

Another object of my invention is to drive such rolls by belting mechanism which is so arranged that by transferring the driving-pulleys to the opposite side of the machine the speed of said rolls may be reversed, so as to run them either as cutting or crushing rolls, as desired.

In the accompanying drawings, Figure 1 represents a segmental view, in cross-section, of a pair of my crushing-rollers. Fig. 2 is a similar view, showing cutting-ribs of size for a second break. Fig. 3 is a similar view of a still smaller corrugation. Figs. 4, 5, 6, 7, 8, 9, 10, 11, and 12 show old forms of corrugations. Fig. 13, Sheet 2, is an end elevation of portion of a roller-mill embodying my improvement, and showing the manner of driving the fast-speeded rollers. Fig. 14 is a view of the belting mechanism for the slow-speeded rollers on the opposite side from the view shown in Fig. 13. Fig. 15 is a plan view of a pair of my rollers.

My improved rollers are represented on Sheet 2 as set in a machine constructed similar to the one shown in Letters Patent No. 250,954, granted me December 13, 1881. The form of ribs on the rollers shown in Figs. 1, 2, and 3 I have found by experience to be substantially better than the older forms shown in the remaining figures on Sheet 1. I form the granulating sides of the ribs of each roll on a parallel line with each other, thus forming acute angles to the radius of the roll, as indicated by the line *a b*, Fig. 1. This angle is preferably about thirty degrees from the radius of the rolls. The opposite side of each rib is concave, as at 2, and the face of the rib is wide and plain, as at 3. The proper proportions for these lines will be to have the face 3 one-half the length of the bevel side, and the length between the ribs on the line of the face of the teeth twice the length of the beveled sides of the ribs. This form of rib is important, as the grains are split without chopping the bran or breaking the germ in the act of reducing by a series of passes through rolls having gradually-reduced sizes of ribs. Again, by making one side of the rib of concave form, having a wide concave opening in the bottom, the grooves or channels clean much better than in any of the old forms of corrugations, and at the same time the grain is split and granulated better and with a less amount of "break-flour" in each of the gradual reductions, removing the bran in a more clean and better manner. The bevel and concave channels hold the fine material and carry it past the point of contact with the adjacent roll without subjecting it to a further reduction while the coarse portions are being reduced. The wide faces of the rolls furnish better wearing-surfaces than those where the ribs are pointed, and the faces of the ribs are on a true circle, and are not destroyed by the corrugating-tool, which is the case when the teeth are pointed. These rolls may be made non cutting or crushing by reversing the speed of the rollers, which is accomplished by transferring the pulleys on the shafts of the slow-speeded rollers to the shafts of the fast-speeded rollers. It will be advantageous in this case to round off the back corners of the cutting-faces of the ribs.

A indicates the frame of a machine on which are mounted my improved rollers.

B B′ C C′ indicate the driving-pulleys mounted on the fast-speeded rollers, and D D′ the driving-pulleys mounted on the shafts of the slow-speeded rollers.

G indicates the tightener-pulleys, and G′ the driving-pulley on the main shaft.

F indicates the belt driving the fast-speeded rollers, and E the belt driving the slow-speeded rollers.

When it is desired to reverse the speed of

the two sets of rollers, so as to run them as non-cutting rollers, pulleys C are interchanged with pulleys D, and my improved rollers will operate with most of the advantages hereinbefore named, accruing from the peculiar shape of the outer faces.

What I claim is—

1. In a machine for grinding grain, the combination of two co-operating rolls having the series of granulating-ribs, each rib being formed with a plain outer face, and on one side with the plane bevel 1, arranged at an angle to the radius of the roll, and on the opposite side with the concave 2, substantially as and for the purpose shown and described.

2. In a machine for grinding grain, the combination of two co-operating rolls having a series of granulating-ribs, one side of each rib being inclined or beveled and the opposite side concaved, and having a wide curved outer face, substantially as herein set forth.

3. In a grinding-mill, the combination of two co-operating grinding-rolls having ribs formed with the bevels, concaves, and plain outer faces, with belt-pulleys arranged on the ends of the roll-shafts, and adapted to be interchanged for shifting the relative speeds of the two co-operating rolls, substantially as herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

UDOLPHO H. ODELL.

Witnesses:

FRANK S. BREENE,

S. G. CAIN.