

E. S. HOWLAND.

DRESS FOR METALLIC GRINDING RINGS.

No. 177,718.

Patented May 23, 1876.

Fig. 1.

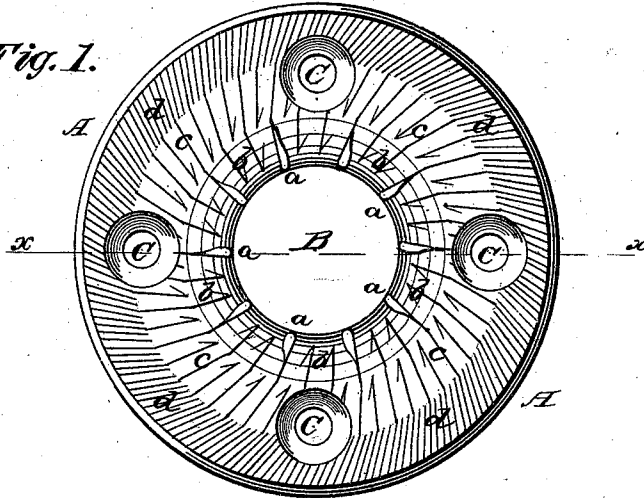


Fig. 2.

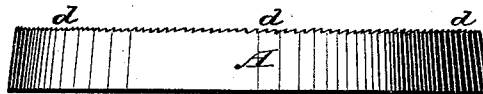
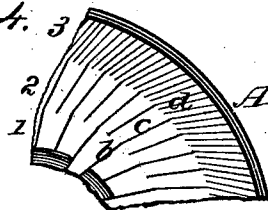


Fig. 3.



Fig. 4.



WITNESSES:

E. A. West
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EDMUND S. HOWLAND, OF BATAVIA, ILLINOIS.

IMPROVEMENT IN DRESS FOR METALLIC GRINDING-RINGS.

Specification forming part of Letters Patent No. 177,718, dated May 23, 1876; application filed October 25, 1875.

To all whom it may concern:

Be it known that I, EDMUND S. HOWLAND, of Batavia, Kane county, State of Illinois, have invented new and useful Improvements in Dress for Metallic Grinding-Rings, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a top or plan view; Fig. 2, a side elevation; Fig. 3, cross-section on line *x* *x* of Fig. 1; and Fig. 4, a broken section, showing the lines of the drift.

The object of this invention is to overcome the difficulties which have heretofore existed in adjusting the feeding ridges or drift with the grinding surface or drift, so as to make the feeding and grinding uniform. Where the feed has a greater capacity than the grinding-surface the mill is liable to clog, and much additional power is required to run the ring, and where the capacity of the grinding-surface exceeds that of the feeding the full capacity of the mill cannot be obtained, and the grinding-surfaces are liable to wear against each other.

The point to be attained is the perfect corresponding and equal capacity of the feeding and grinding and the discharge, and this equal condition is obtained, and these difficulties obviated, by my invention, the nature of which consists in placing the feeding-drifts partly in the eye of the ring, and partly upon its face, with a steep or sharp curve, as shown in Fig. 3; in accelerating the travel of the grain between the rings, by increasing the tangent or making the draft stronger as soon as the grain is partially crushed; and in finishing the grinding under a still stronger draft at the outer edge of the face; and in making the second and third grinding-faces very shallow or fine, as shown at Figs. 1 and 2.

In the drawing, A represents the body of the grinding-ring; B, the eye or central opening; C, the holes for attaching the rings to suitable backing-plates; *a*, the feeding-drifts; *b*, the grinding-drifts, which project partly into the feeding portion of the ring between the gathering-points *a*; *c*, the ridges projecting across the second and third grinding-faces; *d*, the short ridges, projecting or running across the third grinding-face. 1, Fig. 4, represents

the feeding-drifts or portion of the ring; 2 and 3, the grinding-faces, having each different angles or tangents of the grinding-ridges, which change the draft.

The ring shown is a full-sized three-and-a-half inch grinding-ring, which is half an inch thick, and which is usually made of cold-short or white cast-iron, but may be made of any suitable metal. The ridges are made very short, so as to leave the space between them very shallow, as shown, with the exception of the feeding-drift *a*. By reason of the strong curve upon which the feeding-drifts *a* are placed no more grain will be taken up than can readily pass between the grinding-faces, and while they have a sufficient space between them to keep the rings full they cannot overcrowd the grinding-surfaces.

By giving the grinding-ridges on the face 2 a little stronger draft than that given the feed, the grain will be taken from the feeding-ridges, and carried away a little faster than it would be if the line of draft was continued on the same tangent, and thus prevent clogging at this point; and where the grinding-ridges pass to the face 3 the tangent is still further increased, so as to increase the draft and prevent clogging at this point. As shown, the faces 1, 2, and 3 are nearly of equal width, but they may be varied, and each of them made wider or narrower, as desired. By this arrangement of the feeding and grinding ridges a wide surface is obtained without the clogging of the wide surfaces heretofore used.

I am aware that this result has been attempted to be obtained by making the grinding-surfaces curvilinear; but the difficulty with these is that if started at a sufficient angle to feed the rings properly, the draft at the outer edge becomes too strong, and throws the grain out without a proper finishing of the grinding; and also that rings have been made with a change in the tangent near the outer edge of the face; but this change has uniformly been made to check instead of to accelerate the draft.

By my improvements I have, after long experiments, succeeded in equalizing the angle of the tangent, so as to produce exactly corresponding changes in the draft to prevent clogging, and to dispose of the grain as fast

as it enters between the rings, and by making the cut of the finishing-ridges very slight there is no space left in which the meal can adhere to the rings, so that they are at all times clean and clear, so as to do their work properly.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The solid grinding-ring A, having the feeding-drifts *a* partly upon the curved surface of the eye, with the grinding-drifts *b* extending partly into the eye, and the entire

grinding-surface upon three tangents, substantially as and for the purpose set forth.

2. The shallow spaces between the grinding-ridges in combination with the fine sharp ridges for preventing clogging, substantially as set forth.

EDMUND S. HOWLAND.

Witnesses:

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