No. 819,599. PATENTED MAY 1, 1906.

A. J. ROBINSON.

GRINDING MILL DISK.

APPLICATION FILED MAR. 10, 1905.

2 SHEETS—SHEET 1.

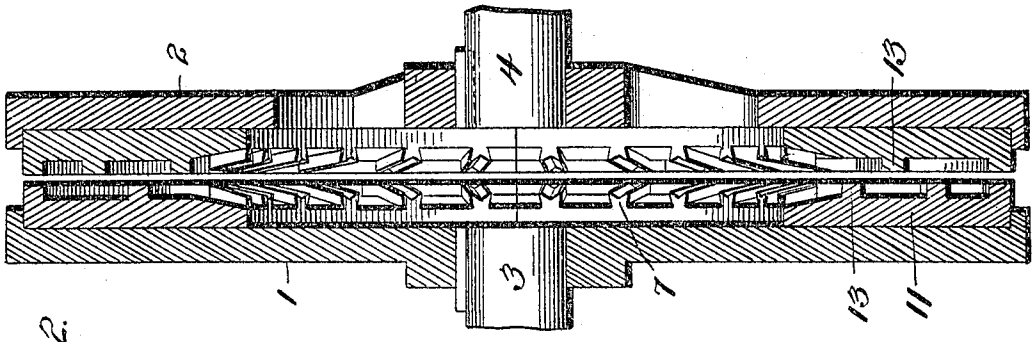

Fig. 2.

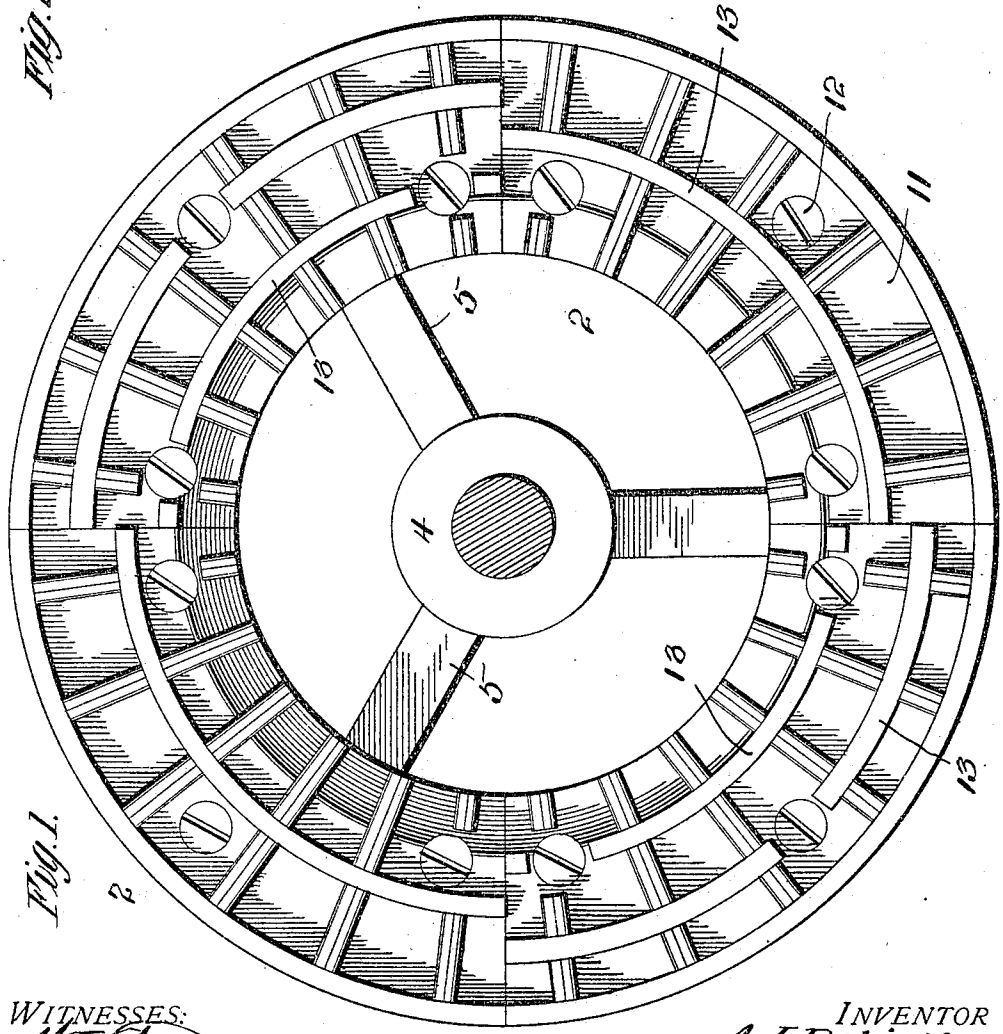

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

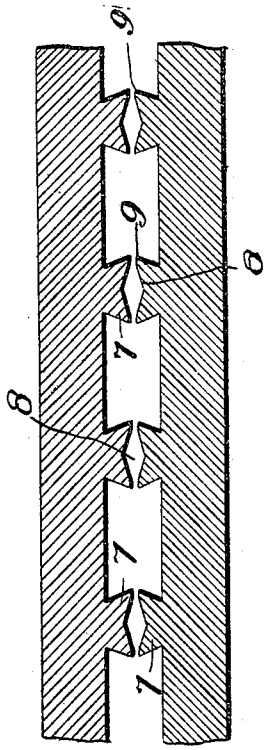


Fig. 6.

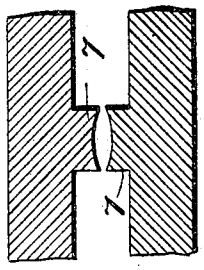


Fig. 5.

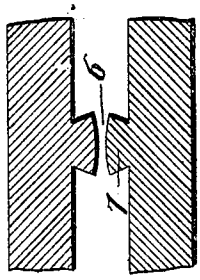
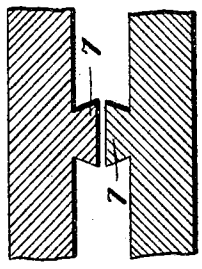


Fig. 4.



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AARON J. ROBINSON, OF FREMONT, NEW HAMPSHIRE.

GRINDING-MILL DISK.

No. 819,599. Specification of Letters Patent. Patented May 1, 1906.

Application filed March 10, 1905. Serial No. 249,420.

To all whom it may concern:

Be it known that I, AARON J. ROBINSON, a citizen of the United States, residing at Fremont, in the county of Rockingham and State of New Hampshire, have invented a certain new and useful Grinding-Mill Disk, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to grinding-mills of the type embodying a divided horizontal shaft and opposing grinding-disks mounted on the inner adjacent ends of the sections of the divided shaft and actuated to rotate simultaneously in opposite directions.

The invention relates more particularly to the grinding-disks themselves; and the object of the invention is to provide a disk having teeth of such construction and arrangement as to effect a material saving in the labor and expense of grinding or dressing the faces of the teeth, at the same time materially increasing the life and durability of the disk as a whole. By the construction hereinafter described the liability of the material being ground to choke or become congested between the opposing disks is reduced very considerably and the movable disk may be adjusted in relation to the fixed disk to compensate for wear. The disks are also reversible or capable of rotating in either direction, thus adding to the durability and life of the same.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination, and arrangement of parts, as herein fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a view in elevation of the working face of one of the disks embodying the present invention. Fig. 2 is a diametrical section through the opposing disks of a grinding-mill. Fig. 3 is an enlarged detail section through a portion of one of the disks, showing the form, construction, and arrangement of the improved teeth. Fig. 4 is a similar view showing a single reversible undercut tooth with a flat working surface. Fig. 5 is a similar view of the same, illustrating how the flat-faced teeth wear off and become rounded in use. Fig. 6 is a similar view illustrating straight-sided teeth with recessed working faces.

Like reference-numerals designate corresponding parts in all figures of the drawings.

Referring to the drawings, 1 and 2 represent a pair of opposing disks mounted on the inner adjacent ends of the two sections 3 and 4 of a divided shaft, one of the disks being partially open at the center and provided with arms or spokes 5, so as to allow the material to pass to the space between the disks, the arrangement thus far described being that usually employed in mills of the type referred to.

In the ordinary construction of the disk-teeth the outer or working faces of the teeth are flat, as shown in Fig. 4, when the disks are first used; but as they wear down under the grinding action of the mill the opposite corners or angles of the teeth become worn off or rounded, as shown in Fig. 5, thereby leaving wedge-shaped spaces 6, in which the ground material becomes packed and congested, thus increasing the friction of the teeth and seriously interfering with the proper operation of the mill, reducing the output, and impairing the quality of the meal. In order to overcome this objection and at the same time impart increased durability to the disks and render them easier and cheaper to grind or sharpen and restore to proper working condition, the working faces of the teeth (indicated by the numeral 7) are recessed or grooved lengthwise, as shown at 8, thus leaving acute-angled opposite corners or edges, which are ground or dressed off, as shown at 9. The opposite sides of the teeth are preferably undercut, as shown at 10; but, if desired, the opposite sides of the teeth may be straight or substantially at right angles to the body of the disk, as shown in Fig. 6, the main feature of the invention residing in recessing the outer working faces of the teeth as described.

In the construction of the disks the disk-faces may be in one piece or composed of a plurality of sections or segments 11, and these segments are secured to the bodies of the disks by suitable fasteners 12, as shown in Fig. 1. The segments are provided with series of concentric segmental ribs 13, and these ribs are made to alternate or are arranged in staggered relation, as clearly shown in Fig. 1, so that in the rotation of the opposing disks the segmental ribs are disposed in alternate order, as shown in Fig. 2, at times and at other times in opposite relation, so as to properly retard the material on its way through the mill and between the disks as it is acted upon by the teeth 7, which

extend radially outward and inward and connect at one or both ends with the ribs. The opposite corners or edges of the teeth lie in about the same plane with the outer faces of the ribs, and thus the depressed or recessed portions of the teeth lie below or within the plane of the outer faces of the ribs.

In grinding or dressing the teeth only the corners or edges thereof have to be looked after, thus effecting a great saving in labor and time. The greatest advantage, however, lies in the fact that by reason of the recesses in the working faces of the teeth the latter will not readily become clogged with the material passing through the mill, thus increasing the output of the mill and improving the quality of the meal. The necessity of frequent regrinding of the teeth is also done away with, as the teeth may be said to be self-sharpening, and as wear takes place the adjustable disk may be moved closer to the fixed disk to compensate therefor. The disks as a whole are easier running on account of the reduction of friction incident to the recessing of the teeth and are also reversible or adapted to be rotated in either direction.

The invention hereinabove described is applicable to grinding-mills of either single or double runners or any mill employing a metal grinding-disk.

Having thus described the invention, I claim—

1. In a grinding-mill, a grinding-disk embodying teeth each having undercut side faces and a recessed working face.

2. A grinding-disk embodying a plurality of segments each having one or more concentric ribs, the ribs of one segment alternating or being staggered with relation to those of the adjoining segments, and teeth extending radially from the ribs and having their working faces recessed to provide acute-angled cutting edges.

3. A grinding-disk embodying segmental concentric ribs arranged in staggered relation, and teeth extending radially from the ribs and having their working faces recessed below or within the plane of the outer faces of the ribs.

4. A grinding-mill embodying removable hard-metal grinding-plates each having one or more concentric ribs, and teeth extending radially from the ribs and having their working faces recessed in such manner that the opposite corners or edges thereof project beyond the plane of the center of the tooth.

5. A reversible-drive grinding-disk embodying removable hard-metal grinding-plates each having one or more concentric ribs and teeth extending radially from the ribs and provided with cutting edges at opposite sides and having their working faces recessed below and within the plane of the outer faces of the teeth.

In testimony whereof I affix my signature in presence of two witnesses.

AARON J. ROBINSON.

Witnesses:
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REXFORD M. SMITH.