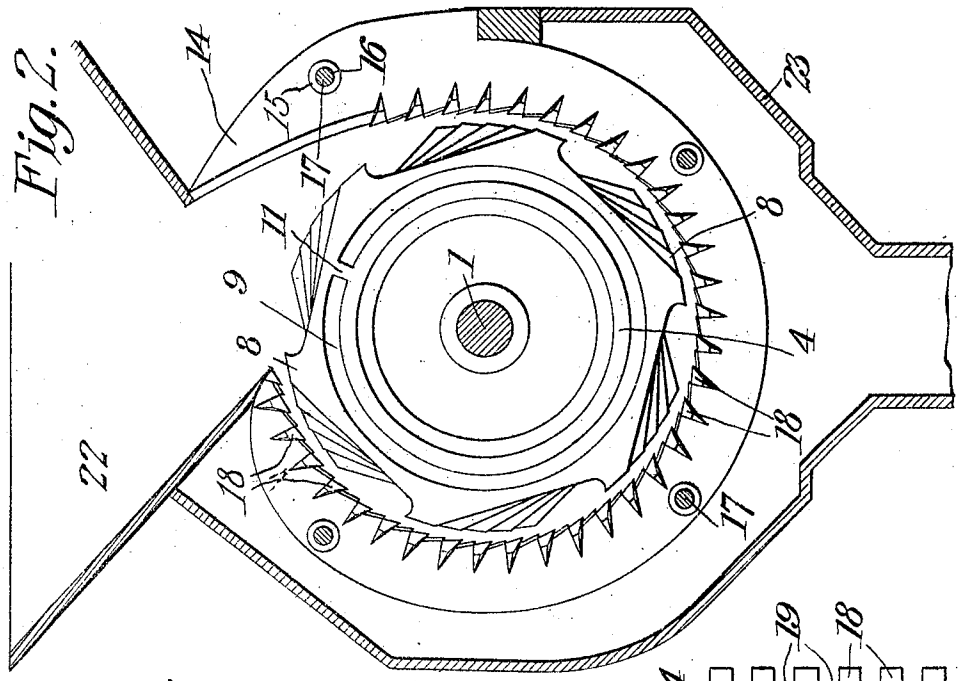
No. 872,321. PATENTED DEC. 3, 1907.

W. B. ALLEN & W. BLALACK.

GRINDING MILL.

APPLICATION FILED AUG. 3, 1906.

Fig. 2.



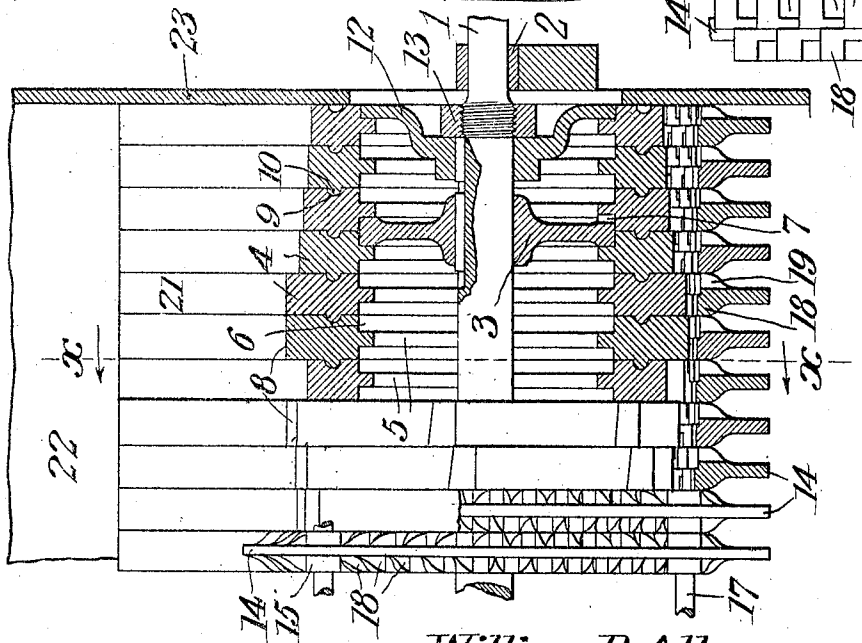


Fig. 3.

Fig. 1.

WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM B. ALLEN AND WILLIAM BLALACK, OF PARSONS, KANSAS.

GRINDING-MILL.

No. 872,321. Specification of Letters Patent. Patented Dec. 3, 1907.

Application filed August 3, 1906. Serial No. 329,126.

To all whom it may concern:

Be it known that we, WILLIAM B. ALLEN and WILLIAM BLALACK, citizens of the United States, residing at Parsons, in the county of Labette and State of Kansas, have invented a new and useful Grinding-Mill, of which the following is a specification.

This invention relates to mills for grinding corn, cobs and the like and its object is to provide a durable and efficient mill of this character having a grinding cylinder constructed in a novel manner and coöperating with a concave of novel construction.

A further object is to form both the cylinder and concave of sections any one of which can be removed in the event of wear or breakage.

A still further object is to provide a concave having openings between the teeth thereon through which the ground material is free to fall.

With the above and other objects in view the invention consists of a concave made up of a plurality of curved bars having teeth upon their concave faces, said teeth extending laterally so that when the bars are assembled a concave working face is formed made up entirely of the series of teeth of the bars. Openings are formed between the teeth of each bar through which the ground material may fall. A grinding cylinder is rotatably mounted within the concave and is made up of a plurality of interlocking toothed rings supported in a novel manner upon a shaft.

The invention also consists of certain other novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a longitudinal section through a portion of a cylinder and concave, parts of said cylinder and concave being also shown in elevation; Fig. 2 is a section on line x—x Fig. 1; and Fig. 3 is a plan view of a portion of one of the bars of the concave and showing the working or toothed face thereof.

Referring to the figures by characters of reference, 1 is a drive shaft mounted in suitable bearings 2 and having a desired number of spacing disks 3 keyed or otherwise secured thereon. These disks are surrounded by a series of rings 4 having interior ribs 5 which are removed from the edges of the rings so that when said rings are assembled in the manner hereinafter described grooves 6 are formed within some of which the disks 3 are seated. These disks are adapted to be fastened within said grooves by means of keys 7 or in any other preferred manner. Each of the rings 4 has a plurality of teeth 8 extending from its periphery, the outer ends of said teeth being substantially flat while their forward or advancing edges are concave and merge into the straight rear face of the tooth in front thereof. The particular contour of the teeth is clearly shown in Fig. 2. Each ring has a circular groove 9 arranged concentrically in one face and a corresponding bead 10 on its opposite face. A bridge 11 is formed across the groove 9 in each ring and this bridge is adapted to project between the ends of the bead 10 of the adjoining ring so that when all of the rings are assembled in contact it becomes impossible for any of them to rotate independently of the others. The bridges 11 are so disposed that when the rings are assembled the teeth 8 are disposed out of alinement as clearly shown in Fig. 2. In order that the rings may be tightly clamped together concave disks or heads 12 are feathered on the shaft 1 and fit within the end rings 4 and bear against the ribs 5 therein. Nuts 13 are screwed upon the shaft 1 and are adapted to bear against the heads 12 so as to clamp said heads against the ribs of the end rings.

The grinding cylinder which is made up of the rings 4 rotates within a concave consisting of a plurality of curved bars 14 having bosses 15 arranged upon opposite faces thereof and around alining openings 16 through which connecting rods 17 extend. The concave or working face of each bar 14 has two parallel series of similar teeth 18 alternately arranged and extending laterally from the bar. The teeth of the various bars are adapted to contact when said bars are assembled so that a toothed working face of considerable area is therefore produced. Spaces are formed between the teeth of each series as shown at 19. The bars 14 are not toothed throughout their lengths but the toothed portions thereof are disposed substantially concentric with the shaft 1 and but slightly removed from the teeth 8. The remaining portions of the bars extend upward from the cylinder and have laterally extending flanges 20 extending along their

inner faces and which are adapted to contact so as to produce a smooth wall as shown at 21 in Fig. 1. This wall constitutes a continuation of a hopper 22 arranged upon a casing 23 adapted to inclose the concave so as to receive material discharged therethrough.

It is thought that the operation of the mill will be fully understood. The grinding cylinder is rotated at a desired speed and the cobs, corn or other material to be ground is placed in the hopper and fed between the wall 21 and the cylinder. Teeth 8 will draw the material over the teeth 18 and the pulverized material will fall through the openings 19 and into the casing. Should any one of the rings 4 or bars 14 become broken or should it be necessary for any other reason to replace them, new ones can be easily substituted by detaching the parts as is obvious. While the cylinder and concave have been shown and described as made up of similar parts it is to be understood that the rings and bars can be made of different sizes and so assembled as to form a conical rotatable grinding element and a corresponding concave.

Considerable importance is attached to the particular contour of the teeth 8. By providing these teeth with flat outer faces in the manner shown the same can be ground many times without materially reducing the size of the cylinder. The outer ends or working faces of these teeth may be hardened and instead of beveling the advancing edges of these teeth as shown in Fig. 1 said edges may be straight across. Any suitable means, not shown, may be employed for adjusting the bars 14 so as to properly fit around the grinding cylinder.

The preferred form of the invention has been set forth in the foregoing description but we do not limit ourselves thereto as we are aware that modifications may be made therein without departing from the spirit or sacrificing the advantages thereof, and we therefore reserve the right to make such changes as fairly fall within the scope of the claims.

What is claimed is:

A mill comprising a concave, and a revoluble grinding element mounted therein, said element comprising a shaft, a plurality of toothed rings surrounding and out of contact with the shaft, each of said rings having an annular groove in one face and an annular bead upon its opposite face, the bead of each ring being disposed to project into the groove in the adjoining ring, each groove being intersected by a bridge disposed to project into the bead of the adjoining ring to prevent independent rotation of the rings, an interior annular rib integral with each ring, the ribs of said rings forming annular grooves therebetween, a spacing disk upon the shaft having its periphery seated within one of said grooves, means engaging the disk and one of the ribs to prevent independent rotation of the disk and rings, heads upon the shaft bearing against the ribs of the end rings, and means for clamping the heads against the rings to lock the rings together, certain of said rings being supported out of contact with the shaft by the adjoining rings.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

WILLIAM B. ALLEN.
WILLIAM BLALACK.

Witnesses:
J. D. JONES,
ALICE COVALT.