

D. S. ANTHONY.
GRINDING MILL.
APPLICATION FILED JAN. 25, 1907.

Patented Oct. 20, 1908.

3 SHEETS—SHEET 1.

901,770.

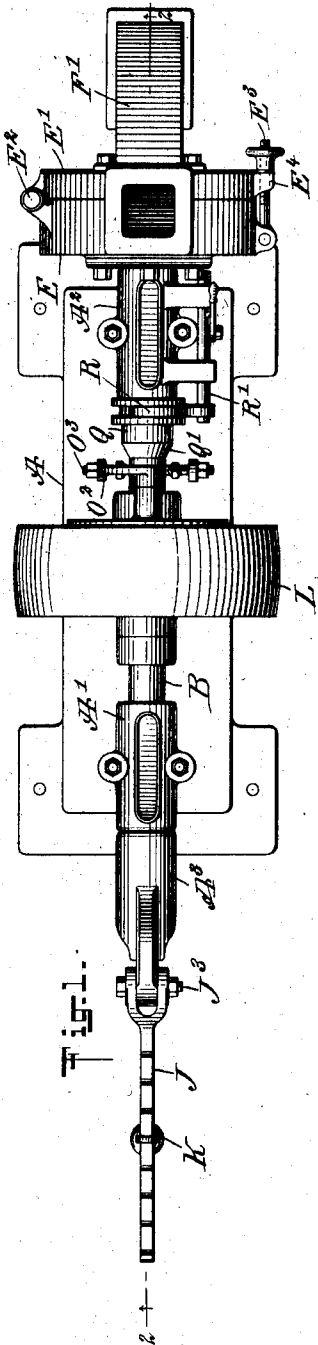


Fig. 1.

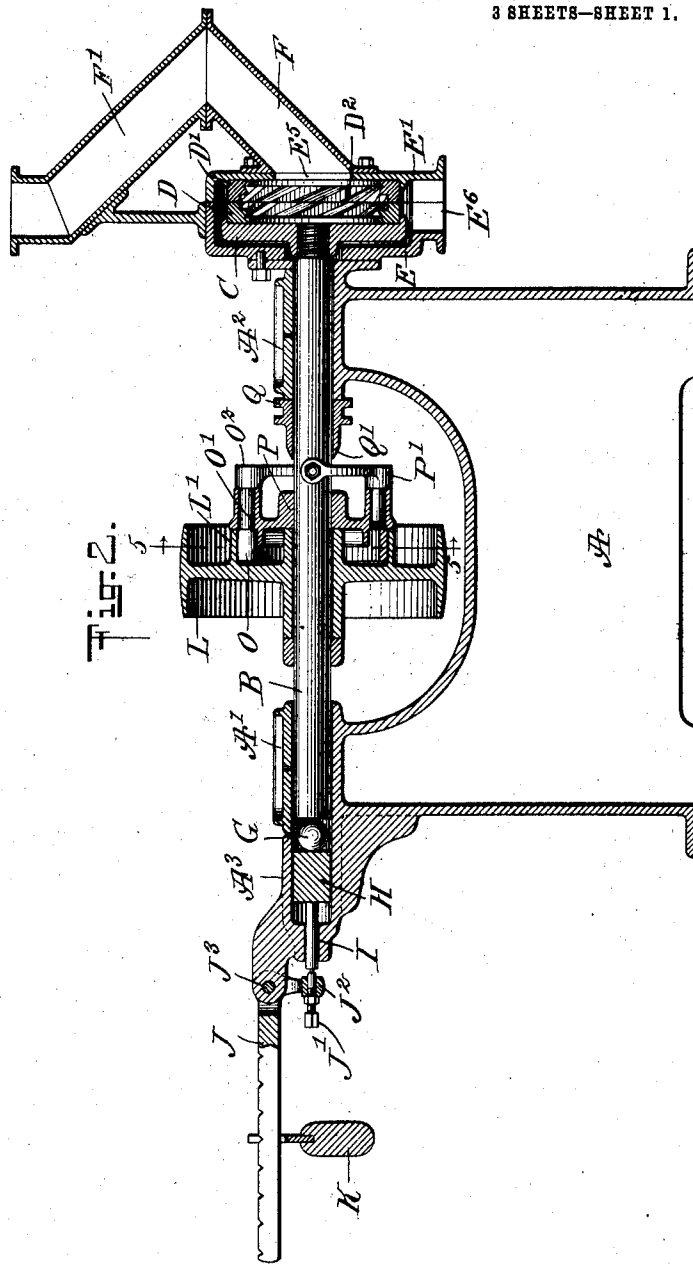


Fig. 2.

WITNESSES

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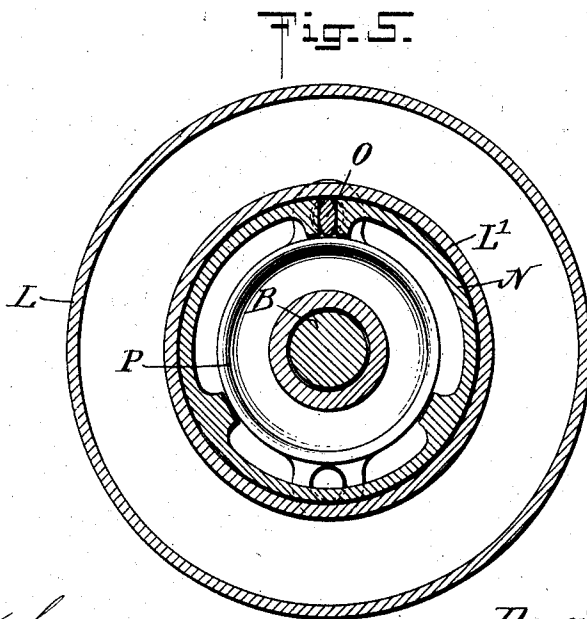
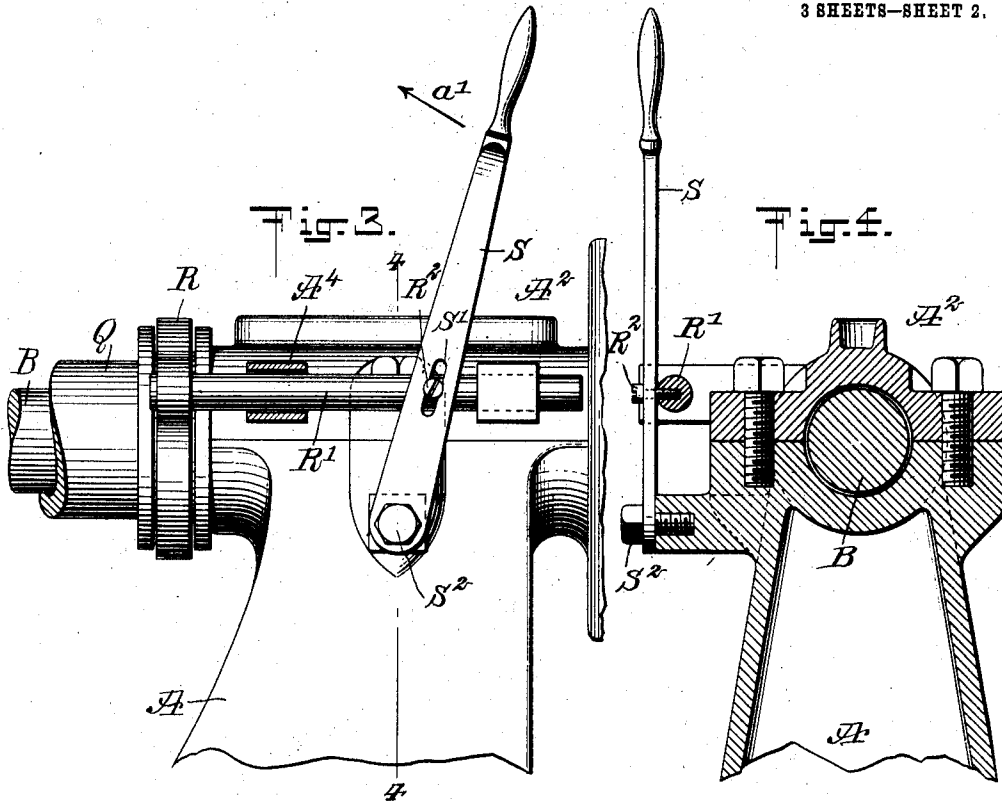
ATTORNEYS

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3 SHEETS—SHEET 2.



WITNESSES

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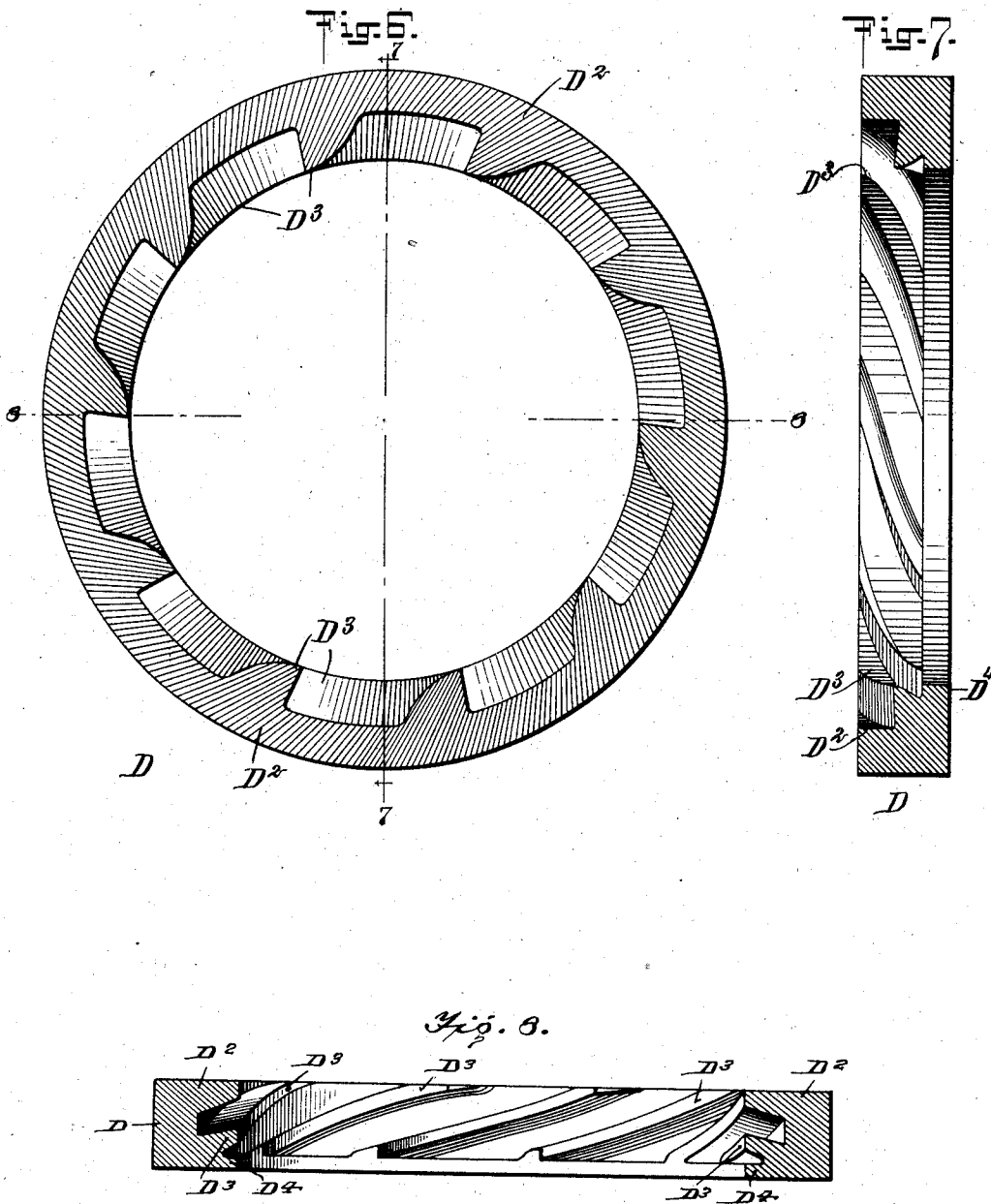
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

DAVID SMITH ANTHONY, OF DURANGO, MEXICO.

GRINDING-MILL.

No. 901,770.

Specification of Letters Patent.

Patented Oct. 20, 1908.

Application filed January 25, 1907. Serial No. 354,088.

To all whom it may concern:

Be it known that I, DAVID SMITH ANTHONY, a citizen of the United States, and a resident of Durango, Mexico, have invented a new and Improved Grinding-Mill, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved grinding mill, more especially designed for grinding middlings, and arranged to insure ready grinding of the corn or other material to any desired degree of fineness, and to allow easy sharpening of the grinding members.

The invention consists of novel features and parts and combinations of the same, which will be more fully described herein-after and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the improvement; Fig. 2 is a longitudinal sectional elevation of the same, on the line 2—2 of Fig. 1; Fig. 3 is an enlarged side elevation of the stopping and starting mechanism; Fig. 4 is a transverse section of the same on the line 4—4 of Fig. 3; Fig. 5 is an enlarged transverse section of the friction drive; Fig. 6 is an enlarged face view of one of the grinding rings, Fig. 7 is a sectional side elevation of the same on the line 7—7 of Fig. 6, and Fig. 8 is a section on line 8—8 of Fig. 6.

On a suitably constructed frame A is journaled in bearings A', A², the main driven shaft B, provided at one end with a head C in which is secured a grinding ring D operating in conjunction with a fixed grinding ring D', both grinding rings D and D' being arranged within a casing E having its end E' hinged at E² to the casing, to allow of conveniently opening the casing whenever desired, with a view to gain access to the grinding rings D and D'. Normally the end E' is locked in a closed position by an eye bolt E³ fulcrumed on the casing E and engaging lugs E⁴ on the end E', as plainly indicated in Fig. 1. The end E' is provided with an inlet opening E⁵ to which leads the delivery spout F, secured to the outer face of the end E', so as to swing with the same when the latter is opened, the upper end of the spout F being adapted to

register with a feed spout F' fixed on the casing E. The bottom of the casing E is provided with an outlet E⁶ for discharging the middlings into a receptacle or into other means for delivering the middlings to a suitable place of discharge.

The grinding rings D and D' are provided on their opposite faces with corrugations D² forming grinding teeth for grinding the corn or other material to the desired degree, and in order to feed the material properly between the two grinding faces of the grinding rings D and D', each of the latter is provided with inclined teeth D³ extending from the grinding face of the ring to the annular flange D⁴ at the outer face of said ring. The teeth extend from the inner periphery of the ring to about the center of the ring and each are of a length to extend under the next preceding tooth, so that the teeth overlap one another. By thus constructing the rings the corn or other material delivered by the spout F through the opening E⁵ into the casing falls onto the feed teeth D³, which latter deliver the material to the grinding faces, so that the material is properly ground by the corrugations D² of the grinding rings.

By constructing the grinding rings with teeth as described the grinding faces D² can be kept sharp and the grinding rings can be used until worn to the said flanges D⁴.

In order to hold the removable grinding ring D in proper grinding relation with the fixed grinding ring D', pressure is exerted against the outer end of the shaft B in an axial direction, and for this purpose the following device is provided: The outer end of the shaft B abuts against a ball G, pressed on by a pressure block H mounted in a suitable bearing A³ on the main frame A, which bearing forms a continuation of the outermost bearing A' for the shaft B. The pressure block H is engaged by a pin I mounted to slide in a bearing A³ and extending to the outside thereof, and the outer end of this pin I is engaged by a set screw J' held in an arm J² forming part of the lever J fulcrumed at J³ on the bearing A³. A weight K is adjustably held on the lever J so as to exert more or less pressure in an axial direction on the shaft B by the connections above described; that is, the arm J², the set screw J', the pin I, the pressure block H and the ball G. By the use of the ball G interposed between the pressure

block H and the shaft B the friction is reduced to a minimum, and at the same time all end thrust is taken up. By adjusting the weight K on the lever J, the grinding ring D can be pressed with more or less force against the fixed grinding ring D'.

In order to rotate the shaft B the following device is provided: A pulley L is mounted to rotate loosely on the main shaft B, and is connected by a belt with other machinery, for imparting a continuous rotary motion to the pulley L. The pulley L is provided with an auxiliary rim L' adapted to be engaged at its inner surface by a split friction ring N pressed on at its ends by a cam O secured on a shaft O' journaled in a carrier P keyed or otherwise secured to the shaft B so as to rotate the same. On the shaft O' is secured an arm O² carrying a set screw O³ adapted to be engaged by the beveled end Q' of a sleeve Q mounted to slide on the shaft B and engaged by a shifter arm R held on a rod R' mounted to slide longitudinally in suitable bearings A⁴ arranged on the main frame A. The bar R' is provided with a pin R² extending into an elongated slot S' on a hand lever S fulcrumed at S² on the main frame A and under the control of the operator. Now when the latter swings the hand lever S in the direction of the arrow a' then the sleeve Q is moved from the right to the left, and its beveled end Q' moves in contact with the arm O², so as to impart an outward swinging motion to the arm O², to rock the shaft O' and to cause the cam O to open up or expand the friction ring N, with a view to press the same in firm contact with the rim L', so that the rotary motion of the pulley L carries the ring N along, and consequently the carrier P and shaft B, to rotate the grinding ring D.

In order to counterbalance the carrier P as much as possible a dummy arm P' is provided similar to the arm O² and secured on the carrier P diametrically opposite to the arm O².

Having thus described my invention, I

claim as new and desire to secure by Letters Patent:—

1. A grinding mill having a fixed grinding ring and a revoluble grinding ring, the rings having a common horizontally disposed axis and each having inclined and overlapping teeth, said teeth extending from the inner surface of the outer face to the inner or grinding face of the ring and from the inner periphery of the ring to about the center thereof.

2. In a grinding mill, a frame having bearings, one of which is elongated, a shaft mounted in the bearings, a grinding disk on one end of the shaft, a stationary grinding disk, a sliding block in the elongated bearing, a ball between the block and the other end of the shaft, a pin slidably mounted in the elongated bearing and having one end engaging the block and its other end projecting out through said bearing, a weighted lever pivoted to the elongated bearing and provided with an arm, and a screw in the arm and engaging the said pin.

3. A grinding mill, comprising a frame, a casing at one end of the frame and having a central inlet opening therein, a shaft mounted in the frame to have endwise movement and having one end projecting into the casing, a grinding ring secured directly to the end of the shaft in the casing, a second grinding ring secured to the inner face of the casing, the rings being each provided with inclined and overlapping teeth extending from the inner surface of the outer face to the inner or grinding face, a yielding pressure device for the end of the shaft to hold the revoluble grinding ring in grinding relation to the fixed ring, and means for operating said shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID SMITH ANTHONY.

Witnesses:

JAMES A. LE ROY,
GEORGE H. EMSLIE.