C. N. McLAUGHLIN.

GRINDING MILL.

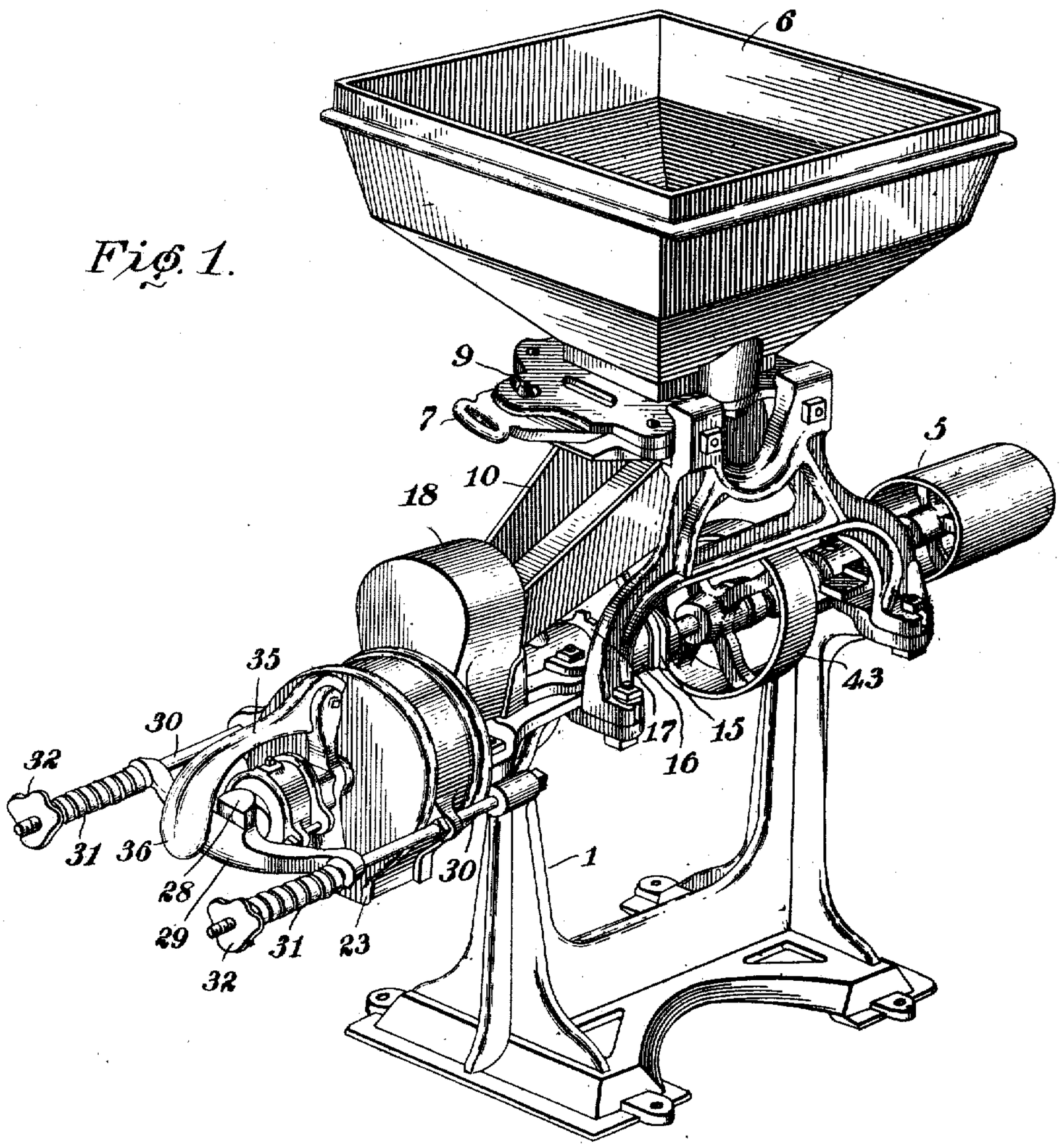
APPLICATION FILED JULY 6, 1908.

911,061.

Patented Feb. 2, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

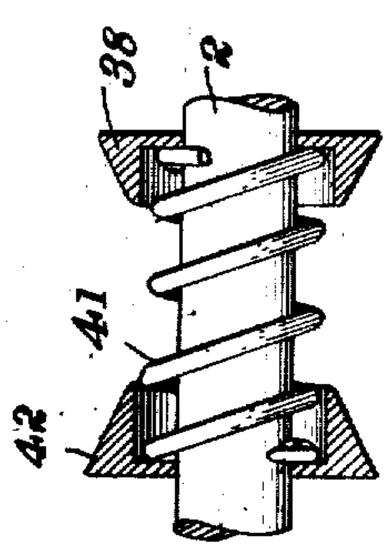


Fig. 4.

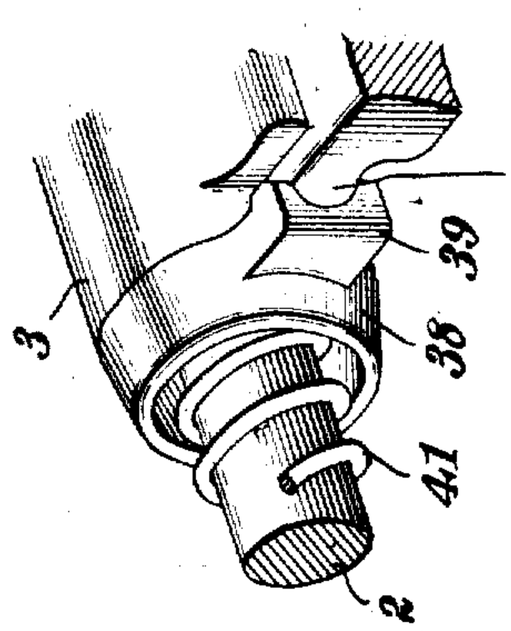
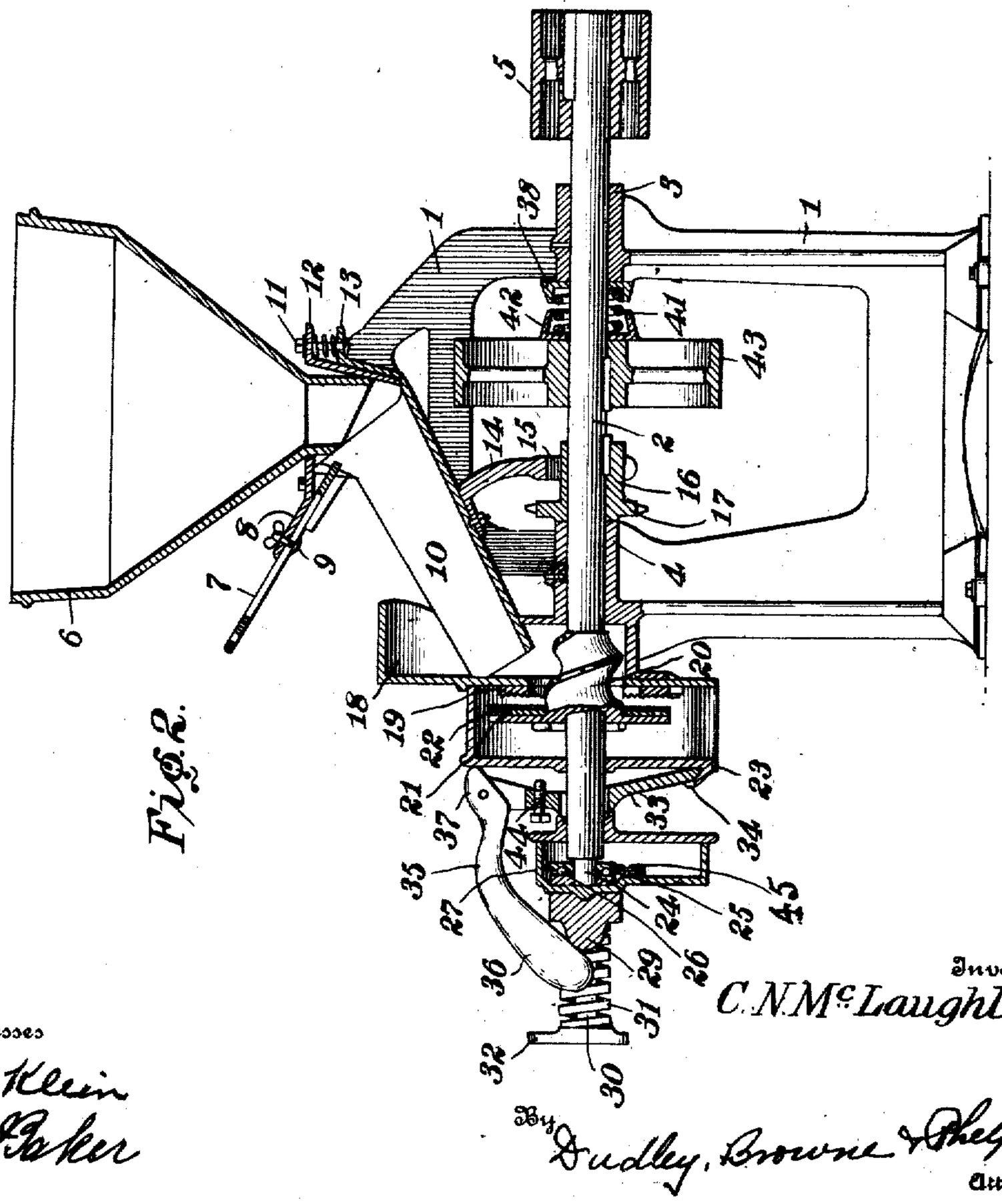


Fig. 2.



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UNITED STATES PATENT OFFICE.

CUNNINGHAM N. McLAUGHLIN, OF WINONA, MINNESOTA, ASSIGNOR TO NEW WINONA MANUFACTURING COMPANY, OF WINONA, MINNESOTA, A CORPORATION OF MINNESOTA.

GRINDING-MILL.

No. 911,061. Specification of Letters Patent. Patented Feb. 2, 1909.

Application filed July 6, 1908. Serial No. 442,049.

To all whom it may concern:

Be it known that I, CUNNINGHAM N. McLAUGHLIN, citizen of the United States, residing at Winona, in the county of Winona and State of Minnesota, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification.

My invention relates to certain new and useful improvements in mills adapted to grind grain, seeds, spices, drugs and the like, and the object of my present invention is to improve and simplify the construction thereof, to make the same more durable and efficient, and to accomplish these ends with a reduced cost of manufacture.

My improvements particularly relate to the type of grinding mills shown and described in Letters Patent granted to me September 1, 1903, No. 737,953, and February 6, 1906, No. 811,945, and are specifically designed for this type of machine. It is to be understood however that my improvements may be applied to other forms of mills, and that I do not limit myself to their use in connection with these machines, but that it may be applied to any form of construction where found desirable.

My invention consists in certain constructions, combinations and arrangements of parts the preferred form of which will be first described in connection with the accompanying drawings and then the invention particularly pointed out in the claims.

Referring to the drawings wherein the same part is designated by the same reference numeral wherever it occurs, Figure 1 is a perspective view of a mill built in accordance with my invention; Fig. 2 is a central longitudinal section thereof; Fig. 3 is a section of a portion of the bur separating mechanism, and Fig. 4 is a perspective view of a portion of the same mechanism.

In the drawings, 1 designates the frame, 2 the shaft mounted in bearings 3, 4, the shaft having fast on its end beyond the bearing 3, the driving pulley 5.

6 is the hopper secured to the top of the frame and 7 is a sliding valve for controlling the flow of the material to be ground from the hopper. The valve 7 is in the form of a plate and is adjustably held in the bracket 8 by the bolt 9 which passes through a slot in the valve.

10 is an inclined spout extending under the mouth of the hopper to catch the material as it issues therefrom, the spout being pivoted at its upper end on the bolt 11 depending from the projection 12 of the frame, the bolt passing loosely through the opening 13 in the end of the spout.

14 is a spring interposed between the upper surface of the spout and the lower surface of the projection 12, the spring surrounding the bolt 11, whereby the spout is capable of being shaken to cause an even feed of the material to be ground.

Secured to the under side of the spout 10 is an arm 14 which extends downwardly and at its lower end is formed into a fork 15 which straddles a cam 16, fast on the shaft 2, whereby the spout is shaken.

17 is a sprocket which is secured to one end of the cam 16, and which may act to drive an elevator or other attachment by being connected thereto by a chain not however shown.

18 is a housing having an opening in its upper portion into which the lower end of the spout 10 projects. The shaft 2 extends through the lower portion of the housing and on the outer side of the housing and surrounding the shaft the stationary bur 19 is secured.

20 is the feed screw carried on the shaft and extending into the housing 18. On the flange 21 of the feed screw is secured the movable bur 22, adapted to coöperate with the stationary bur 19 and grind the material fed between them by the feed screw.

23 is the housing for the burs, and it is open at the bottom whereby the material after passing through the burs will be delivered from the machine.

The shaft 2 at its end beyond the burs is provided with a reduced end 24 that is inserted into central openings in a pair of disks 25 between which is a series of balls 26, the disks extending into a depression in the side of a casing 27, which forms an oil well for the bearing thus formed, the disks being shown as supplied with a chain 45, by means of which the bearing is kept thoroughly lubricated. The casing 27 is provided on its back with a depression which is engaged by a projection 28 formed on the central portion of a yoke 29 slidably mounted on the rods 30 adjustably mounted on the frame.

31 are the coil-springs mounted on the rods 30 and extending between the ends of the yoke and the hand wheels 32 threaded on the

ends of the rods by means of which the tension of the springs can be adjusted. These springs operate through the yoke to force the shaft longitudinally and the movable bur against the fixed bur.

In order to throw the movable bur out of contact with the fixed bur quickly and readily I provide a lever 33 having a central opening through which the shaft loosely passes and supported at its lower end in the step 34 on the back of the casing 23. The upper end of the lever is preferably forked, and in the fork is pivotally mounted, the cam lever 35 having the handle portion 36 and the cam nose 37 which is adapted to bear against the back of the casing 23, so that when the handle is depressed to the position shown in Fig. 2 it will operate to cause the lever 33 to force the casing 27 away from the casing 23. In order to move the shaft longitudinally when the lever is operated as just described, I loosely mount on the shaft just inside the bearing 3 the cup shaped disk 38 which preferably has the projecting grooved lugs 39 with which a projection 40 on the inner surface of the bearing 3 engages to hold said disk from rotating with the shaft.

41 is a coil spring surrounding the shaft and secured at one end to the inside of the disk 38. The spring at its other end is secured to the inner surface of a second cup-shaped disk 42 loosely mounted on the shaft and held by the spring against the side of the fly wheel 43 fast on the shaft.

From this construction it will be seen that the spring 41 constantly tends to separate the burs, but because the springs 31 are more powerful cannot do so unless the cam lever 35 is operated to force them back as previously described.

In order to limit the movement of the movable bur toward the fixed one I provide the lever 33 with a set screw 44 which, by striking the back of the casing 23, will limit the movement of the shaft under the influence of the springs 31.

I realize that considerable variation is possible in the details of construction and arrangement of parts without departing from the spirit of my invention, and I therefore do not intend to limit myself to the specific form shown and described.

I claim—

1. In a grinding-mill, the combination with a fixed bur, of a longitudinally movable shaft, a bur fast on said shaft, an end-thrust bearing for said shaft, a spring bearing on said end-thrust bearing and tending to hold said burs in contact, a housing for said burs, a pivoted lever mounted between said end-thrust bearing and said housing, and means contacting with said lever and housing to force the thrust bearing away from the housing and separate the burs.

2. In a grinding-mill, the combination with a fixed bur, of a longitudinally movable shaft, a bur fast on said shaft, an end-thrust bearing for said shaft, a spring bearing on said end-thrust bearing and tending to hold said burs in contact, a housing for said burs, a pivoted lever mounted between said end-thrust bearing and said housing, a cam-lever pivoted on the first mentioned lever and adapted to bear against said housing whereby the end-thrust bearing may be moved away from said housing by the cam lever, and the burs separated.

3. In a grinding-mill, the combination with a fixed bur, of a longitudinally movable shaft, a bur fast on said shaft, an end-thrust bearing for said shaft, a spring bearing on said end-thrust bearing and tending to hold said burs in contact, a pair of collars loose on said shaft, a spring interposed between said collars, a part fast on the shaft against which one of the collars abuts, a bearing for the shaft against which the other collar abuts, and means for positively moving said end-thrust bearing longitudinally to permit said last mentioned spring to move the shaft longitudinally and separate the burs.

4. In a grinding-mill, the combination with a fixed bur, of a longitudinally movable shaft, a bur fast on said shaft, an end-thrust bearing for said shaft, a spring bearing on said end-thrust bearing and tending to hold said burs in contact, a housing for said burs, a pivoted lever mounted between said end-thrust bearing and said housing, means for moving said lever to positively force the end-thrust bearing away from said housing and separate the burs, and a set screw adapted to limit the movement of the lever toward the housing.

5. In a grinding-mill, the combination with a fixed bur and a rotatable bur, of a housing for said burs, a feed hopper provided with a regulable opening in its bottom, a spout extending under said opening and into the housing, a pivot for the upper end of the spout, a coil spring on the pivot and bearing on the spout, and means for oscillating said spout on its pivot.

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

CUNNINGHAM N. McLAUGHLIN.

Witnesses:
MAUDE R. WHITE,
W. J. SMITH.