W. H. FULCHER.

ROTARY PULVERIZER.

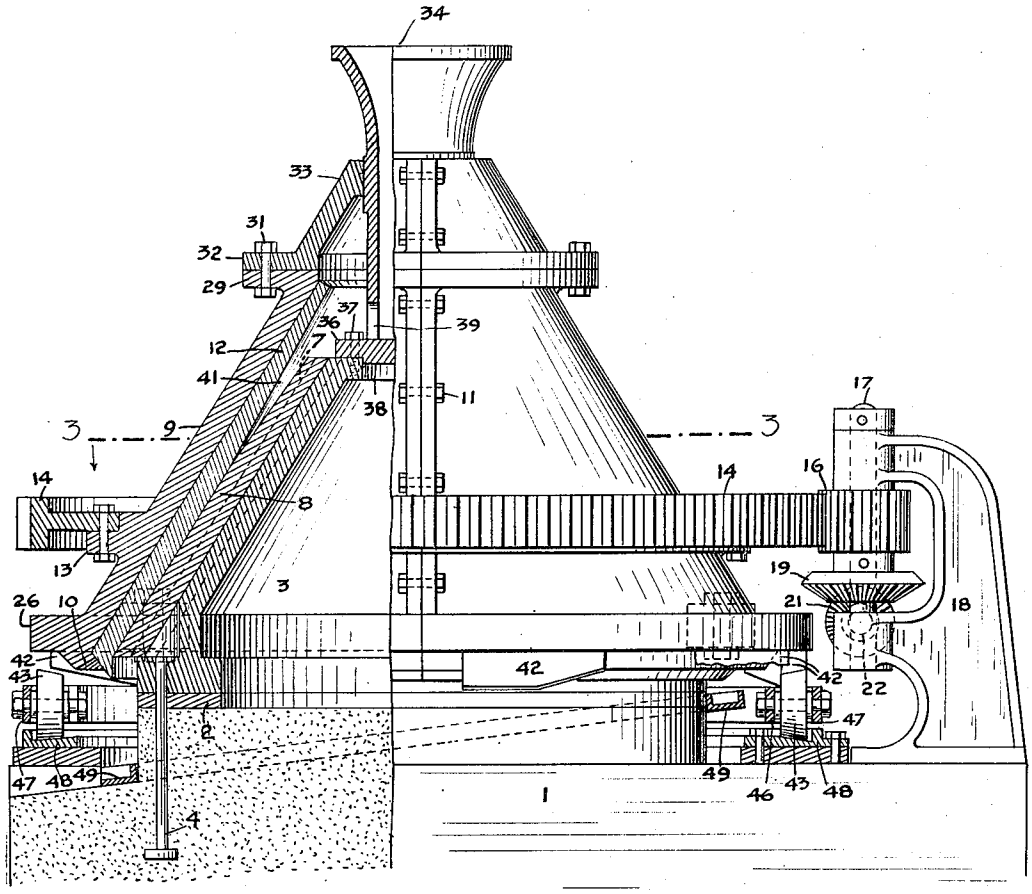
APPLICATION FILED NOV. 14, 1921.

1,429,333.

Patented Sept. 19, 1922.

2 SHEETS—SHEET 1.

FIG. 1



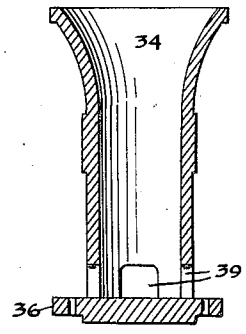


FIG. 2

INVENTOR
W. H. FULCHER

BY Wright & Chesen

ATTYS.

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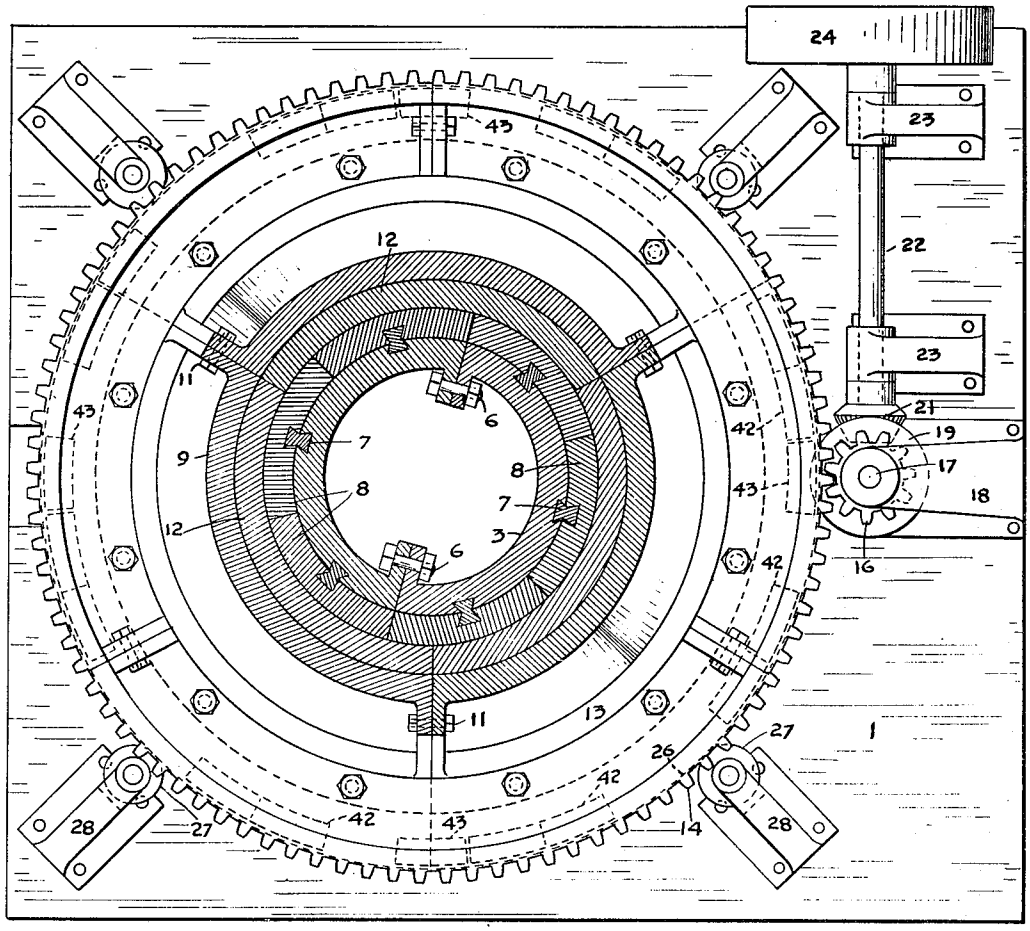


FIG. 3

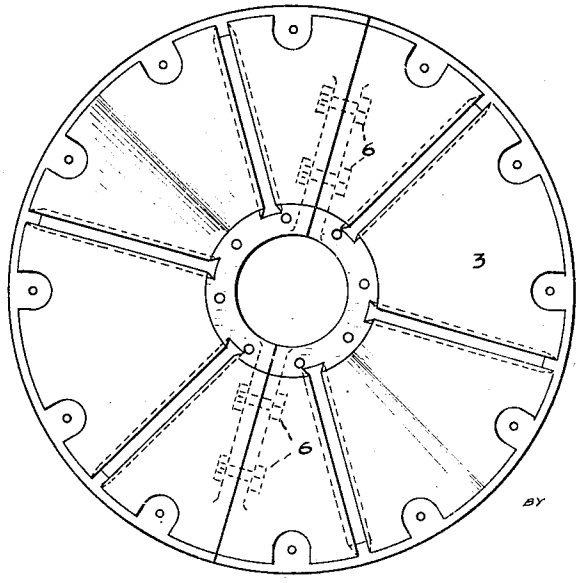


FIG. 4

INVENTOR
W. H. FULCHER

BY

ATTY.

Patented Sept. 19, 1922. 1,429,333

UNITED STATES PATENT OFFICE.

WILLIAM H. FULCHER, OF OAKLAND, CALIFORNIA.

ROTARY PULVERIZER.

Application filed November 14, 1921. Serial No. 515,128.

To all whom it may concern:

Be it known that I, WILLIAM H. FULCHER, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Rotary Pulverizers, of which the following is a specification.

The present invention relates to improvements in grinding mills, the object of the invention being to provide a grinding mill into which the material to be ground can be fed intermittently and ground continuously and very effectively, and discharged in a pulverized condition.

In the accompanying drawings, Figure 1 is a broken side view of my improved grinding mill, Figure 2 is a vertical section of the hopper; Figure 3 is a horizontal section on the line 3—3 of Figure 1; Figure 4 is a top plan view of a stationary cone detached.

Referring to the drawing, 1 indicates a concrete foundation, on which is supported an annular base 2, which supports a conical body 3 secured by bolts 4 to the concrete foundation, said body comprising two sections bolted together, as shown at 6, and carrying keys 7, by which are secured upon said body removable mantles 8, forming a conical surface. Around said conical body is a conical shell 9 made in sections secured together, as shown at 11, and lined on the inside by concaves 12. The lower portion of the shell is formed with an inwardly and downwardly extending flange 10 which engages the lower edges of the concaves and supports the concaves when not resting on the mantles. Said shell is formed with a flange 13, to which is secured a gear ring 14, driven by a pinion 16 on a vertical shaft 17 having bearings in a standard 18, and having secured thereto a bevel wheel 19 meshing with a bevel wheel 21 on a horizontal shaft 22 in bearings 23, and carrying a pulley 24, by which any suitable power may be employed to rotate the shaft. Also said shell is formed at its base with a flange 26, which rotates in contact with rollers 27 supported by suitable mountings 28. Said shell is formed at the top with a flange 29, which is secured by bolts 31 to a flange 32 of a conical head 33, also made up of sections bolted together, and in the upper open end of said head is contained a hopper 34. A base 36 is secured by screws 37 to an inwardly extending flange 38 of the body. Said hopper is formed close to said base with openings 39, through which the material fed to the hopper is discharged therefrom. Said material finds its way by gravity between the mantles 8 and the concaves 12, which mantles and concave are at the upper portion cut away slightly, as shown at 41, to permit the coarse material to pass therebetween.

From the under side of the flange 26 depends lugs 42, which, at the advancing ends, have upwardly extending lower surfaces so as to taper to the front. The lower surfaces of the rear halves of the lugs are horizontal. The front ends of these lugs are adapted, in the rotation of the shell, to engage and ride upon rollers 43, having shafts connected by a ring 46 having extensions or loops 47, said rollers rolling on a circular track 48. As the shell rotates these lugs impinge upon the rollers and roll thereover, at the same time, because of the upwardly sloping lower surfaces of the lugs, causing the shell to be slightly raised, and permitting the material between the mantles and the concaves to drop slightly therebetween until the lugs roll off said rollers, whereupon the shell and concaves drop suddenly upon the material between the concaves and the mantles, and said material is first split or cracked by the sudden drop of the shell and concaves and is then crushed still finer. The shell rotates at a uniform speed, being driven by the motive power, but the rollers, when no longer in contact with the lugs, begin to travel more slowly, until they are caught up by the next series of lugs, which thereupon ride on said rollers, and the process of raising the shell and subsequent descent and crushing of the material is repeated.

It is to be observed that, as the ring 46 rotates, the rollers 43 mounted thereon contact with the lugs 42 always at different points of the track 48, so that there is uniform wear around the track and also in the shell, because the shell drops at a different place each time.

The head 33 of the cone is hollowed out, so that when the shell is raised and suddenly dropped again due to the action of the lugs 42 on the rollers 43, said hollowed out portion serves as a pump to strongly force the water and material to be crushed into the annular space 41.

The crushed material falls into an in-

clined circular trough 49 surrounding the concrete foundation, by which trough it is conveyed away.

The inner surfaces of the lower ends of the concave are accurately cylindrical in form and closely surround the lower edges of the mantles, so that, even when the concaves are raised with the shell, said inner surfaces do not recede any farther from said lower edges. Hence the material cannot escape from between the concaves and the mantles until it has been thoroughly pulverized to so fine a degree as to pass between the lower edges of the mantles and said inner surfaces of the lower portions of the concaves.

I claim:—

1. The combination of a conical body, a conical shell surrounding said body, means for feeding material into the space between said shell and body, means for rotating said shell, elements depending from said shell, and arranged to move in a circular path as the shell rotates, rollers rolling in a circular path immediately beneath that of said elements, and adapted to be engaged by said elements to elevate said shell, and means for connecting said rollers whereby they roll at constant distances apart.

2. The combination of a conical body, mantles secured thereon, a conical shell surrounding said body, concaves secured in said shell, means for feeding material into the space between said concaves and mantles, means for rotating said shell, elements depending from said shell, and arranged to move in a circular path as the shell rotates, rollers rolling in a circular path immediately beneath that of said elements, and adapted to be engaged by said elements to elevate said shell, and means for connecting said rollers, whereby they roll at constant distances apart.

3. The combination of a conical body, mantles secured thereon, a conical shell surrounding said body, concaves secured in said shell, means for feeding material into the space between said concaves and mantles, means for rotating said shell, lugs depending from said shell, and having lower surfaces the front portion of each of which slopes upwardly forwards, said lugs being arranged to move in a circular path as the shell rotates, rollers rolling in a circular path immediately beneath that of the lugs, and means for connecting said rollers, whereby they roll at constant distances apart.

4. The combination of a conical body, mantles secured thereon, a conical shell surrounding said body, concaves secured in said shell, having depending cylindrical lower portions fitting closely around the mantles, means for feeding material into the space between said concaves and mantles, means for rotating said shell, lugs depending from said shell, and having lower surfaces the front portion of each of which slopes upwardly forwards, said lugs being arranged to move in a circular path as the shell rotates, rollers rolling in a circular path immediately beneath that of the lugs, and means for connecting said rollers, whereby they roll at constant distances apart.

WILLIAM H. FULCHER.