

No. 774,329.

PATENTED NOV. 8, 1904.

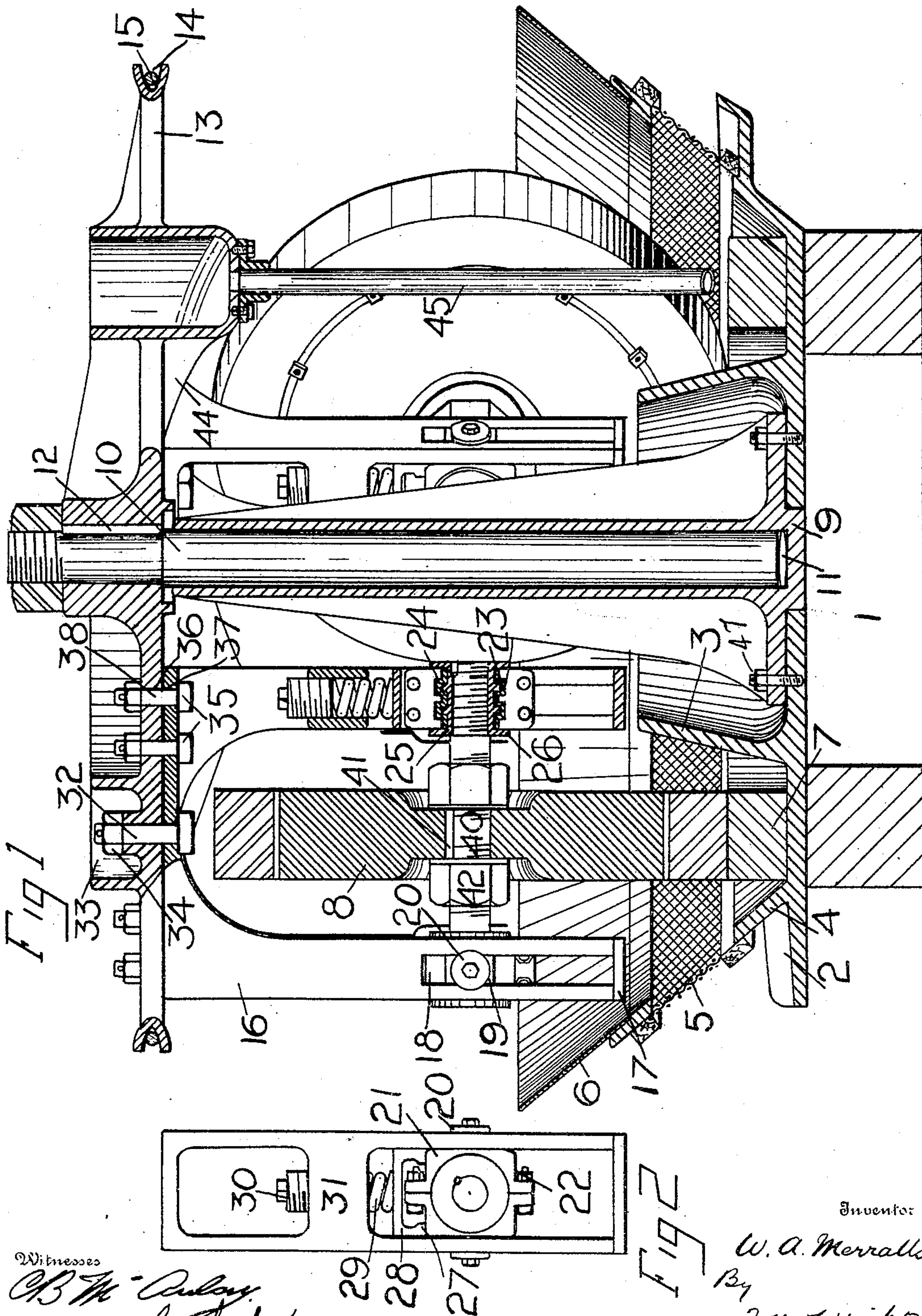
W. A. MERRALLS.

EDGE RUNNER.

APPLICATION FILED MAR. 21, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
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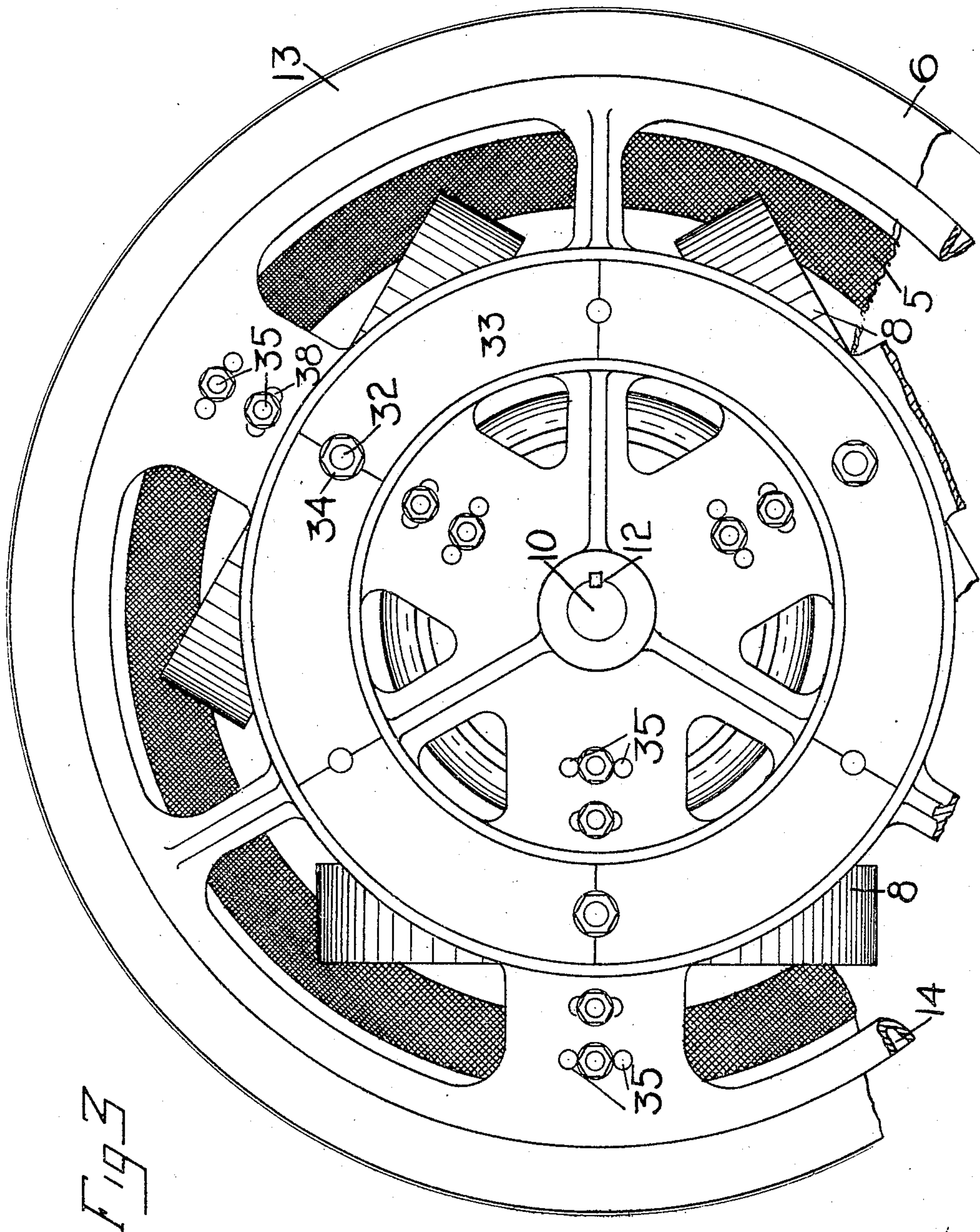


Fig 3

Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM A. MERRALLS, OF SAN FRANCISCO, CALIFORNIA.

## EDGE-RUNNER.

SPECIFICATION forming part of Letters Patent No. 774,329, dated November 8, 1904.

Application filed March 21, 1904. Serial No. 199,152. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. MERRALLS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Edge-Runner Mills, of which the following is a specification.

My invention relates to improvements in edge-runner mills especially adapted for crushing quartz or other hard substances, the objects of my invention being to provide a mill of this character in which, first, the tramming of the roller upon the die can be adjusted in a convenient manner as accurately as possible; secondly, in which the wear upon the roller can with facility be rendered as even as possible by reversing the roller to change the maximum wear from one side to the other; thirdly, to provide a convenient means for adjusting the plane of the roller to grind more or less, as may be desired; fourthly, to provide a cheap and convenient form of distributor.

My invention therefore resides in the novel construction, combination, and arrangement of parts for the above ends hereinafter fully specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section of the mill. Fig. 2 is a detail side view of one of the yokes. Fig. 3 is a broken plan view of the mill.

Referring to the drawings, 1 represents a suitable base upon which is secured the annular pan 2, having inner and outer outwardly-sloping walls 3 4. Upon the outer wall 4 is secured a sloping apron 6, having a screen 5. This apron is not in the present construction extended to a height substantially the same as that of the mill, as is customary; but it is comparatively low, enabling the operator to look down into the mill and observe the material being crushed.

In the pan 2 is secured the annular die 7, upon which revolve the rollers 8. In the center of the pan is secured the tapering step-bearing 9 for the vertical shaft 10 of the mill, which shaft revolves in oil upon the button 11 in the bottom of said step-bearing. Upon the reduced upper end of the shaft is con-

nected, as shown at 12, the driving-wheel 13, having a peripheral groove 14 to receive a driving-rope 15, by which it is rotated. At equal distances around said driving-wheel are secured the yokes 16, one for each roller. In the present instance I have shown the mill as having three rollers, although it may be constructed with a different number. Each yoke is not only arched in a radial plane, but is U-shaped in cross-section. The lower ends of the sides of the U-shaped yoke are joined and prevented from spreading by plates 17. Each side of the U-shaped portion of the hanger is also slotted, as shown at 18, and in said slots slide blocks 19, fitting loosely in the slots so as to permit of slight play therein. Said blocks 19 contain the bearings for the trunnions 20 of the boxes 21 of the roller-shaft. Said boxes 21 are bolted together, as shown at 22, and are grooved, as shown at 23, having correspondingly-grooved sleeves 24 of metal therewithin and a sleeve 25, having flanges 26 on the outside of the boxes. These flanges 26 and the grooves of the sleeves take up the end thrusts of the roller-shafts. Should the roller-shaft be tilted, as by one edge of the roller striking an obstruction, then the boxes on the corresponding side of the roller rise and tilt slightly, their trunnions and the blocks containing the same moving upward in the slots.

The boxes 21 are recessed at their sides in the middle, as shown at 27, to receive the ends of a U-shaped pressed plate 28, which passes over the flanges of the boxes, which are bolted together, and coiled springs 29 bear down upon said presser-plates, the pressure of said springs being adjusted by means of screws 30, screwed into screw-threaded bridges 31 between the sides of the hanger.

Each yoke is supported from the driving-wheel by means of a central pivot-bolt 32, which passes upward into the center of the distributor-channel 33, having a nut 34 on the upper end thereof. It is secured in any desired position by means of other bolts 35, passed through holes 36 in the intermediate piece 37 of the yoke and into holes 38 in the driving-wheel. I have herein shown three such holes 38 for each bolt, permitting of three



adjustments. The holes 38 for each bolt are arranged on the circumference of a circle about the bolt 32 as center. If the central hole of each series be used, there will be the normal grinding effect resulting from a vertical roller rolling in a circular path upon a horizontal surface. To increase the grinding effect, a hole 38 must be used, which will turn the advancing portion of the roller outward; to decrease it, one which will turn it inward. The wear upon these rollers is always greatest on the outside. An important feature of my invention is that this wear may be readily equalized by reversing the roller at suitable times, which may be done by removing the bolts 35 and turning the whole yoke upon the pivot-bolt 32 through half a revolution, which will bring what was the inner edge of the roller to the outside. At present it is necessary to remove the tire of the roller and turn the same true. The same thing is done with the die. By my invention the wear on the roller can be equalized to fit the die, and thus a great expense avoided. This reversibility also has the advantage of changing the wear upon the bearings of the roller-shaft due to the end thrust and also the wear due to the back thrust.

A further important part of my invention resides in the arrangement for adjusting the roller, so as to cause it to tram evenly upon the die. The roller is secured upon the shaft 40 by a key 41, and on each side of said roller is provided a nut 42. By slacking up one of said nuts and screwing up the other the roller may be moved in or out on the shaft to cause it to tram exactly over the die.

A further important feature of my invention is the provision of a convenient and simple form and location of distributor. The distributor-channel 33 is cast integral with the driving-wheel and is arranged with surfaces 44 sloping downward from a point over the center of the wheel to a point intermediate between two wheels, from which a pipe 45 leads to the space between the wheels, depositing the material upon the die. The casting of the distributor-channel integral with the driving-wheel gives weight to the latter and stiffens and strengthens it.

The step-bearing is also changeable side for side, as shown, by removing the bolts 47 and turning the step-bearing through one hundred and eighty degrees. This permits of equalizing the wear on said bearing and neutralizing the excessive wear on one side due to the tension of the driving-rope.

I claim—

1. An edge-runner mill comprising a die, a vertical shaft, roller-supports rotatable about said shaft, each revoluble about a vertical axis intersecting the axis of the roller, vertical rollers pivotally mounted in said supports, and means for securing the supports in positions half a revolution apart, whereby the

rollers are reversible and wear upon them is equalized, substantially as described.

2. An edge-runner mill comprising a die, a vertical shaft, supporting means secured upon the upper portion of said shaft, depending yokes pivotally secured to said supporting means, each revoluble about a vertical axis intersecting the axis of the roller, rollers having shafts mounted in the lower ends of the yokes and means for securing the yokes in positions half a revolution apart, whereby the rollers are reversible and wear upon them is equalized, substantially as described.

3. An edge-runner mill comprising an annular die, a vertical shaft, roller-supports rotatable about said shaft, each revoluble about a vertical axis intersecting the axis of the roller, vertical rollers pivotally mounted in said supports, and means for fixedly securing the yokes in any one of a series of positions against rotation on their pivots, substantially as described.

4. An edge-runner mill comprising a die, a vertical shaft, supporting means carried by the upper end of said shaft, depending yokes pivotally secured to said supporting means, each revoluble about a vertical axis intersecting the axis of the roller, rollers having shafts mounted in the lower ends of said pivots, and means for fixedly securing said yokes in any one of a series of positions against rotation on their pivots, substantially as described.

5. An edge-runner mill comprising a die, a vertical shaft, supporting means secured upon the upper portion of said shaft, yokes pivotally mounted upon said supporting means, each revoluble about a vertical axis intersecting the axis of the roller, and rollers having shafts pivoted in the lower portions of said yokes, said supporting means and yokes having adjustable coengaging means whereby the yokes may be adjustably and fixedly secured at a variable inclination to the supporting means, substantially as described.

6. An edge-runner mill comprising a die, a vertical shaft, supporting means secured upon the upper portion of said shaft, yokes pivotally mounted upon said supporting means, each revoluble about a vertical axis intersecting the axis of the roller and rollers having shafts pivoted in the lower portions of said yokes, said supporting means having for each yoke a series of holes, and the yokes having bolt-holes through which and the holes in the series bolts can be passed to secure the yokes at variable angles with the supporting means, substantially as described.

7. An edge-runner mill comprising a die, a vertical shaft, depending yokes supported by said shaft, rollers having their shafts mounted in said yokes, and means for adjusting each roller in its yoke radially to and from the central shaft, substantially as described.

8. An edge-runner mill comprising a central vertical shaft, roller-shafts extending radially



from said central shaft, bearings for said roller-shafts supported by the central shaft, rollers on said shafts and means for adjusting each roller on its shaft, substantially as described.

9. An edge-runner mill comprising a central vertical shaft, threaded roller-shafts extending radially from said central shaft, bearings for said roller-shafts supported by the central shaft, rollers on said shafts, and a pair of nuts on each shaft on the opposite sides of the rollers for adjusting said rollers on said shafts, substantially as described.

10. An edge-runner mill comprising an annular die, a vertical revolving shaft, depending yokes supported by and secured to said shaft, said yokes being arched in a radial direction from said shaft each side of the yoke being also arched and open at the bottom so as to provide an opening of greater height than width, closures for closing the lower ends of said sides, sliding boxes in said U-shaped portion, roller-shafts in said boxes and rollers carried by said shafts, substantially as described.

11. An edge-runner mill comprising an annular die, a vertical shaft, depending yokes

supported by said shaft, said yokes being arched in a radial direction from said shaft and each side of the yoke being also arched and opened at the bottom, closures for the lower ends of said sides of the U-shaped portions, sliding boxes in said U-shaped portion, roller-shafts in said boxes, rollers carried by said shafts, said boxes being grooved to resist end thrust, and grooved sleeves within said boxes, substantially as described.

12. An edge-runner mill comprising a die, a vertical shaft, a driving-wheel secured upon the upper portion of said shaft, provided at its periphery with means for turning said wheel, supports secured to said driving-wheel and rollers having shafts mounted in said supports, said driving-wheel having formed integral therewith a distributor-channel, provided with openings for feeding the material to the rollers, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM A. MERRALLS.

Witnesses:

FRANCIS M. WRIGHT,  
BESSIE GORFINKEL.