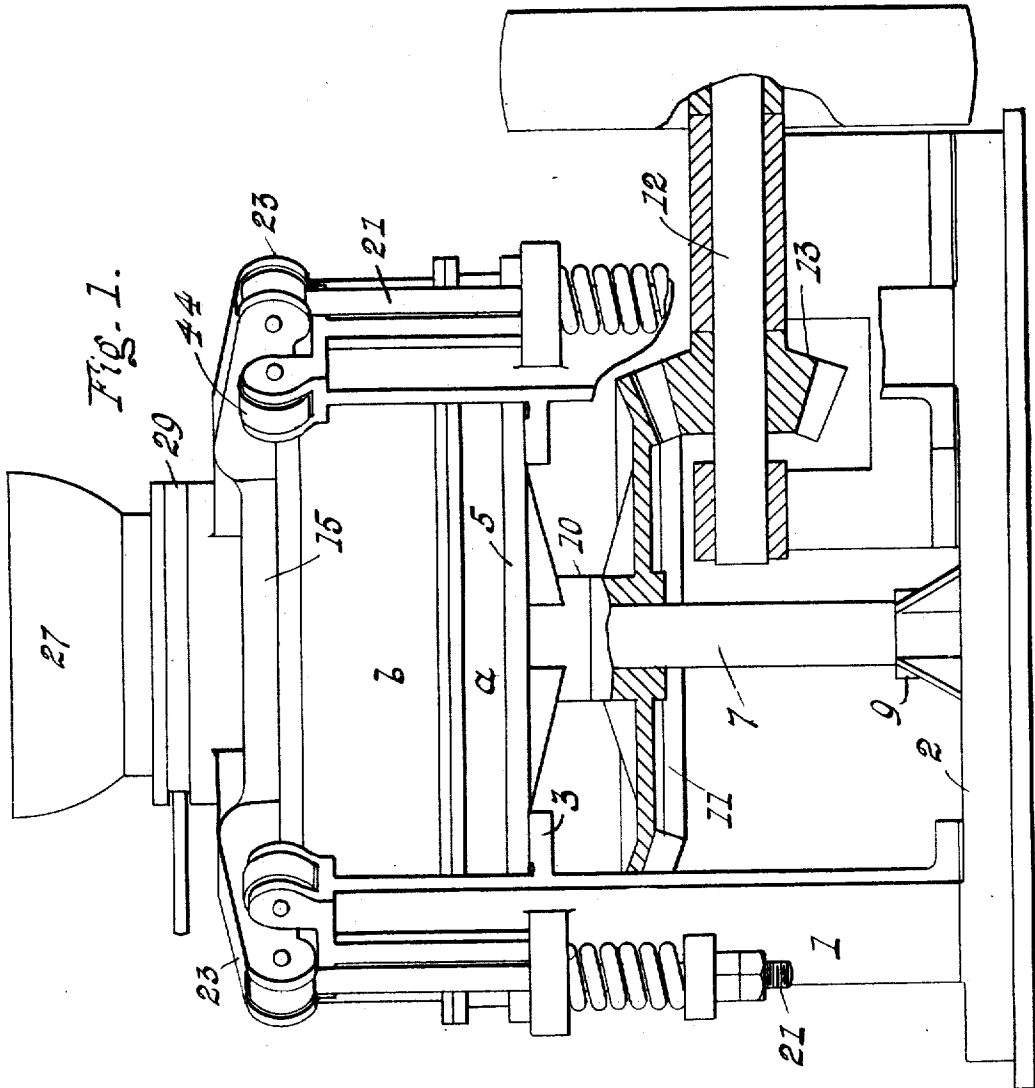


No. 829,173.

PATENTED AUG. 21, 1906.

A. J. SACKETT.
PULVERIZING MILL.
APPLICATION FILED JUNE 28, 1905.

3 SHEETS—SHEET 1.



WITNESSES:

A. E. Miller

A. O. Bayley

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BY *Wm. H. Howard,*

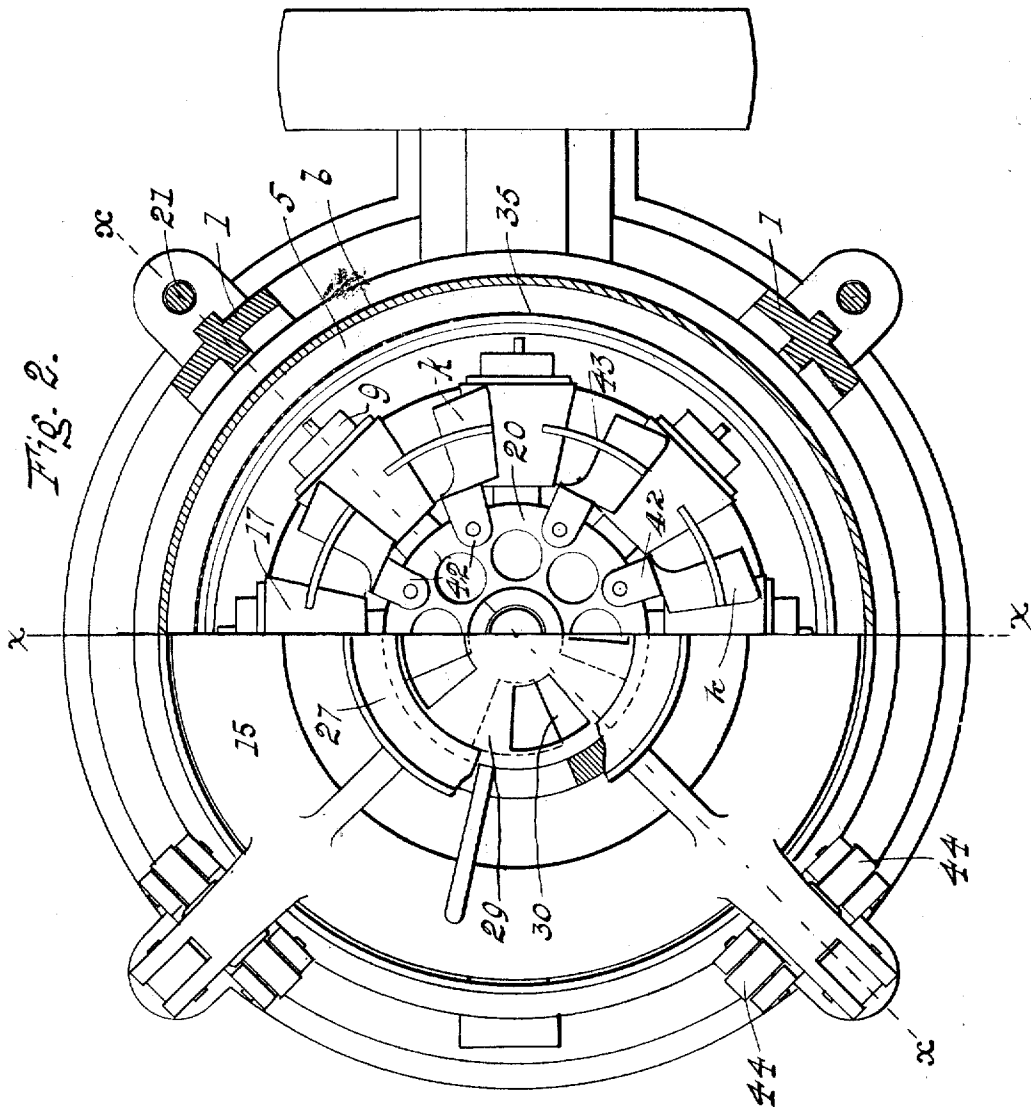
ATTORNEY.

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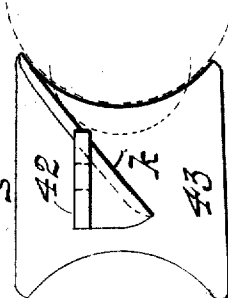
3 SHEETS—SHEET 2.



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Fig. 6.



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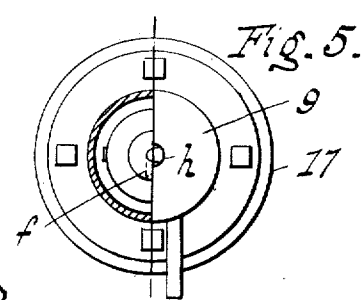
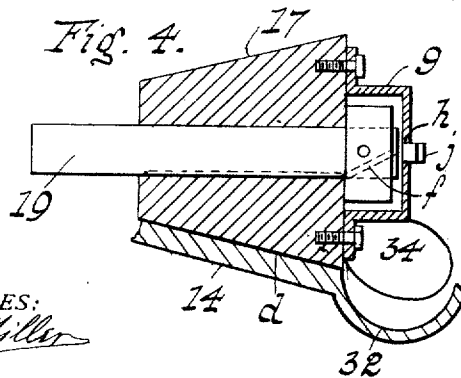
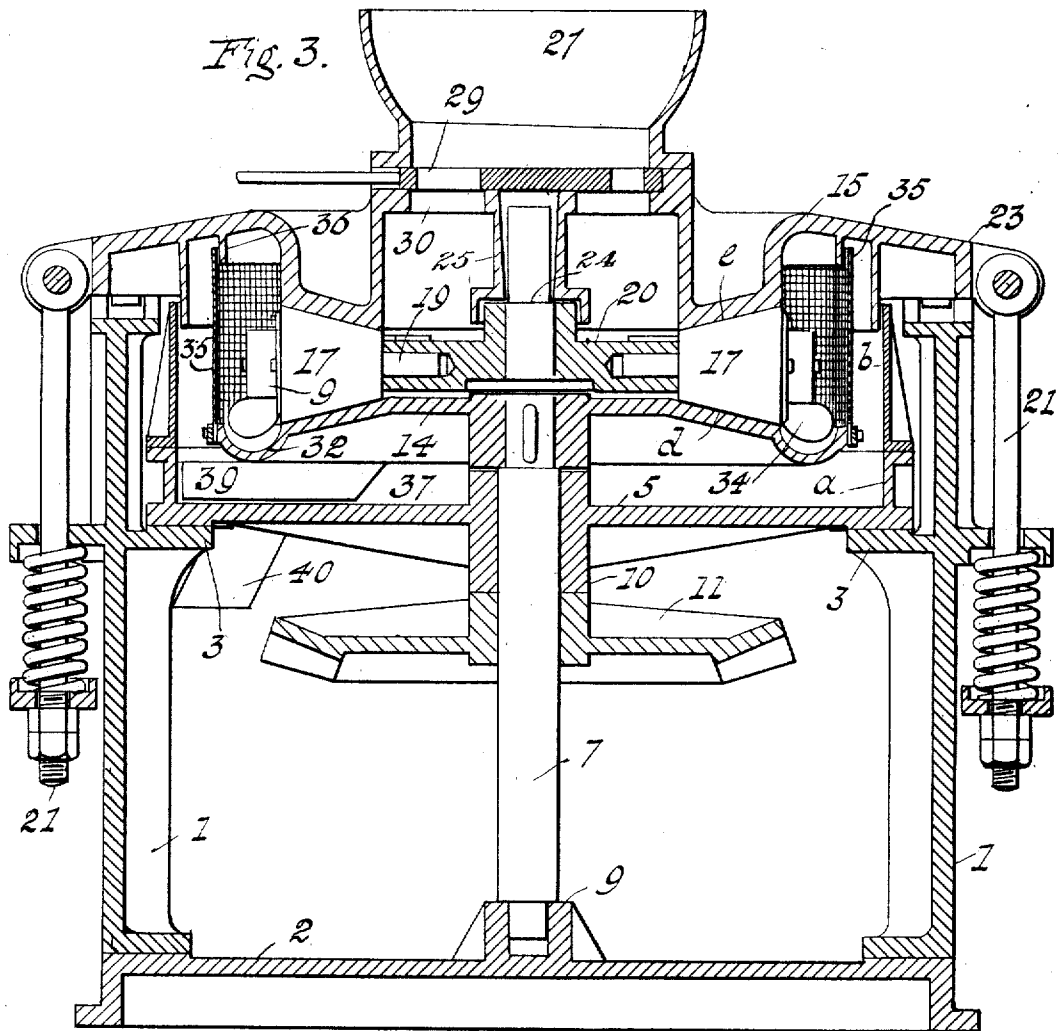
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3 SHEETS—SHEET 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

AUGUST J. SACKETT, OF BALTIMORE, MARYLAND.

PULVERIZING-MILL.

No. 829,173.

Specification of Letters Patent.

Patented Aug. 21, 1906.

Application filed June 26, 1905. Serial No. 266,916.

To all whom it may concern:

Be it known that I, AUGUST J. SACKETT, of the city of Baltimore and State of Maryland, have invented certain Improvements in Pulverizing-Mills, of which the following is a specification.

This invention relates to certain improvements in a pulverizing-mill adapted for the reduction of materials such as phosphate rock, for which Letters Patent No. 777,922 were granted to me on the 20th day of December, 1904, to which reference should be made.

In the description of the present invention which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a partly-sectional view of the improved mill. Fig. 2 is a half-sectional plan of Fig. 1. Fig. 3 is a section of the mill, taken on the dotted line *xx* in Fig. 2. Figs. 4 and 5 are respectively a longitudinal section and a half-sectional end view of one of a series of pulverizing-rolls, together with certain of its attachments forming a part of the mill. Fig. 6 is an enlarged end view of one of a series of plates, illustrated in plan in Fig. 2.

Referring now to the drawings, the frame of the mill is shown as consisting of four ribbed columns 1, united at the bottom by the flanged base-plate 2 and provided with brackets 3, which support the circular plate 5, forming the bottom of the receiving-chamber of the mill. The lower section *a* of the annular wall of the receiving-chamber is integral with the circular plate 5 and flanged at its edge, and the section *b* of the said wall, which is above and attached to the flange of section *a*, is made in segments to admit of the easy removal of one or more of the segments should they become worn. The formation of the part *b* of the wall in segments does not constitute a part of the present invention, and the segmental construction is not, therefore, shown in the drawings.

7 is a central rotary shaft seated in the step 9 and journaled in a boss 10, formed as a part of the plate 5. To this shaft is secured the beveled gear-wheel 11, which is driven from the horizontal shaft 12 (shown only in Fig. 1) by means of the beveled pinion 13. (Also shown in Fig. 1.)

14 is a disk having a conical pulverizing-face *d*, the hub of which is fastened to the end of the central rotary shaft 7.

15 is a covering-plate having an annular conical lower pulverizing-face *e*, similar to the one *d* of the disk 14.

17 17 are conical rolls, shown as eight in number, adapted to turn loosely on studs 19, the inner ends of which are fastened in a rotary head 20, situated centrally of and above the disk 14. To provide for lubrication of the studs within the rolls 17, suitable oil-ducts (denoted in Figs. 4 and 5 by *f*) are made in the studs, and to prevent the entrance of dust and grit from the materials which are pulverized the ends of the studs are covered by caps *g*, which have a central hole *h* for the introduction of the lubricants, and which is stopped by a plug *j*. The said rolls are held tightly between the conical surfaces *d* and *e* by means of the spring-held bars 21, pivoted to arms 23, projecting from the circumference of the covering-plate 15. The rotary head 20 has a central fixed shaft 24, which is loose in a pendent boss 25, integral with the covering-plate 15. The conical rolls 17 are revolved around the central shaft 7 by the rotation of the disk 14 and in such motion pulverizes any material which may be situated between them and the two conical faces *d* and *e*.

27 is a hopper fastened to the top of the non-rotary covering-plate 15, into which the materials to be pulverized are introduced, and 29 an adjustable gate having a suitable handle, which, in connection with a grated plate 30, which is a part of the plate 15, is used to control the passage of the said materials from the hopper to the pulverizing-rolls. The pulverized materials as they pass from the pulverizing-rolls fall to an annular channel 32, formed in the rotary disk 14, and are agitated by the wings 34, (shown particularly in Fig. 4,) which for convenience of attachment are integral with the caps and rotate with them and the said rolls.

35 is a cylindrical screen, shown as fastened to the edge of the disk 14, so as to rotate with it, and the screen is closed at the top by a flange 36 on the non-rotary covering-plate 15.

The pulverized material issuing from the screen falls to the space 37 below the disk 14 and is carried by the scrapers 39, one only of which is shown in Fig. 3, to the delivery-chute 40.

42 42 are plates (shown in Figs. 2 and 6) bolted to the head 20 between the rolls 17, having an inclined extension *k*, which in the

operation of the mill plows up a portion of the upper stratum of the material in the process of grinding, which lies on the disk 14 between the conical rolls, and causes it to pass to the upper portion of the rolls, thus increasing the effect of the pulverizing devices.

43 43 are segmental plates, shown in Figs. 2 and 6 as integral with the inclined extensions *k* of the plates 42 and situated between the rolls, to retard the outward movement of the unground materials due to centrifugal force and prevent their passing to the annular channel 32 without being pulverized, and in order that they will not interfere with the operation of the inclined extensions *k* they are placed about midway of the length of the rolls, as shown in Fig. 2, thus leaving about one-half of each roll exterior of the plates upon which the plowed-up materials will fall to be again acted on by the rolls.

In the operation of the mill the lift of the covering-plate, due to there not always being a uniform thickness of the materials between the rolls and the conical surface of the said plate, will not be uniform throughout the entire circumference of the plate, and to admit of this irregular movement of tilting of the plate and at the same time to provide guides for the same which will produce little friction the arms 23 of the covering-plate are constructed to move between antifriction-rollers 44, arranged to rotate in lugs which project from the upper ends of the ribbed columns 1. This construction is best shown in Figs. 1 and 2.

I claim as my invention—

1. In a pulverizing-mill, the combination of a stationary receiving-chamber, a rotary disk and a non-rotary plate having opposed conical faces, holding devices to draw the disk and plate toward each other, and conical rolls which are interposed between the said conical faces, which in the rotary movement of the disk are rotated on their axes and revolved around the disk, the said rotary disk being provided with an annular chamber situated exteriorly of the outer ends of the rolls to receive the ground materials, and a cylindrical screen situated at the circumference of the said rotary disk, whereby the pulverized materials are screened before enter-

ing the receiving-chamber, substantially as specified.

2. In a pulverizing-mill, the combination of a stationary receiving-chamber, a rotary disk and a non-rotary plate having opposed conical faces, holding devices to draw the disk and plate toward each other, conical rolls which are interposed between the said conical faces, and which in the rotary movement of the disk are rotated on their axes and revolved around the disk, a cylindrical screen situated at the circumference of the said rotary disk, whereby the pulverized materials are screened before entering the receiving-chamber, and devices carried by the said rolls which serve to agitate the ground materials within the said screen and return a portion of them to the upper surface of the said rolls to be repulverized, substantially as specified.

3. In a pulverizing-mill, the combination of a rotary disk and a non-rotary plate having opposed conical faces, conical rolls which are interposed between the conical faces, which in the rotary movement of the disk are rotated on their axes and revolved around the disk, means to draw the said non-rotary plate toward the rotary disk, fixed devices situated exteriorly of the non-rotary plate whereby the same is held against rotation, the same carrying rollers between which extensions of the non-rotary plate are situated and are guided in their up-and-down movement, substantially as specified.

4. In a pulverizing-mill, the combination of a stationary receiving-chamber, a rotary disk and a non-rotary plate having opposed conical faces, holding devices to draw the disk and plate toward each other, and conical rolls which are interposed between the said conical faces, which in the rotary movement of the disk are rotated on their axes and revolved around the disk, the said rotary disk being provided with an annular chamber situated exteriorly of the outer ends of the rolls to receive the ground materials, substantially as specified.

AUGUST J. SACKETT.

Witnesses:

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OREGON MILTON DENNIS.