

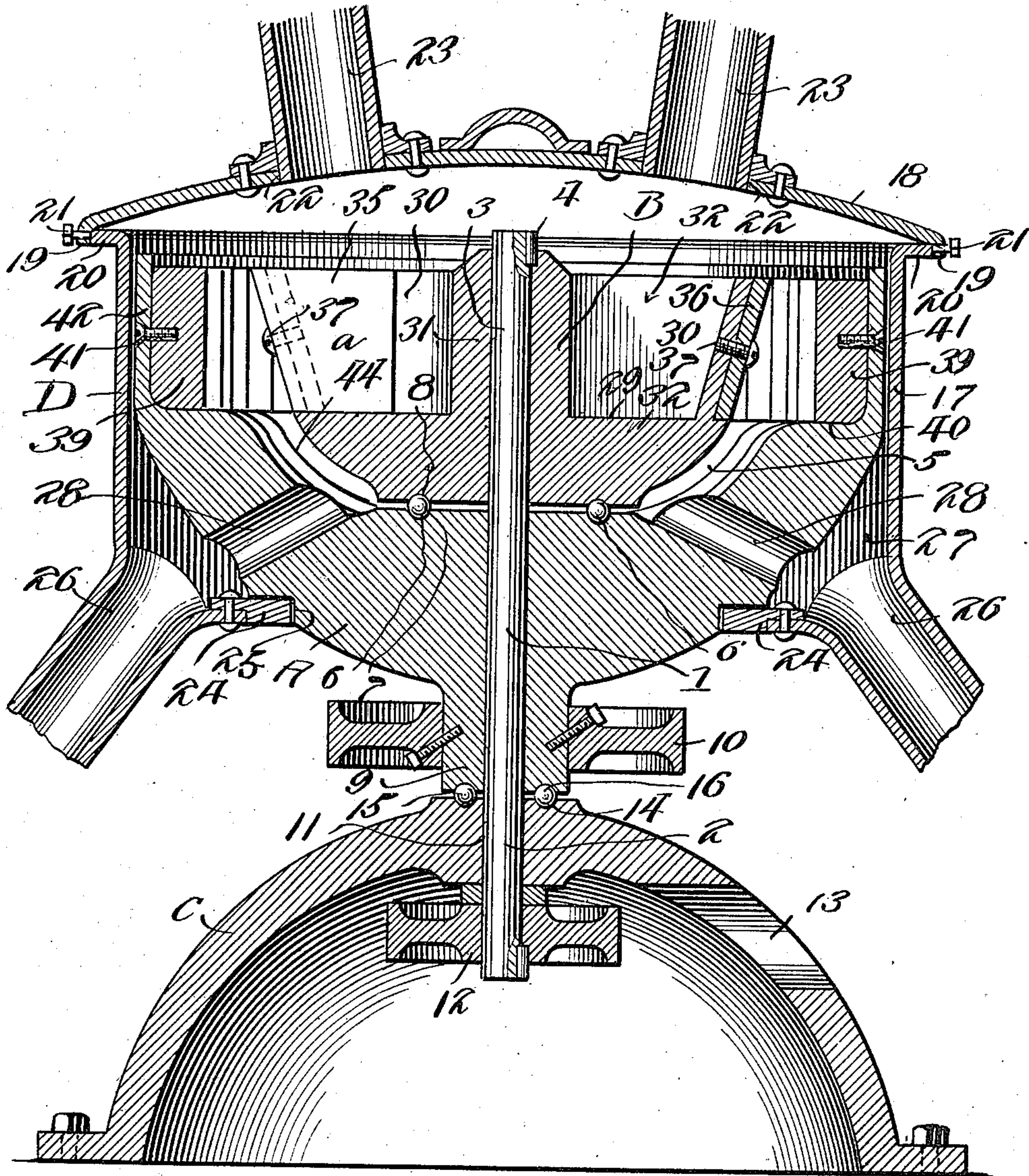
E. P. GORDON.
CENTRIFUGAL PULVERIZER.
APPLICATION FILED NOV. 28, 1908.

964,102.

Patented July 12, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig 2.

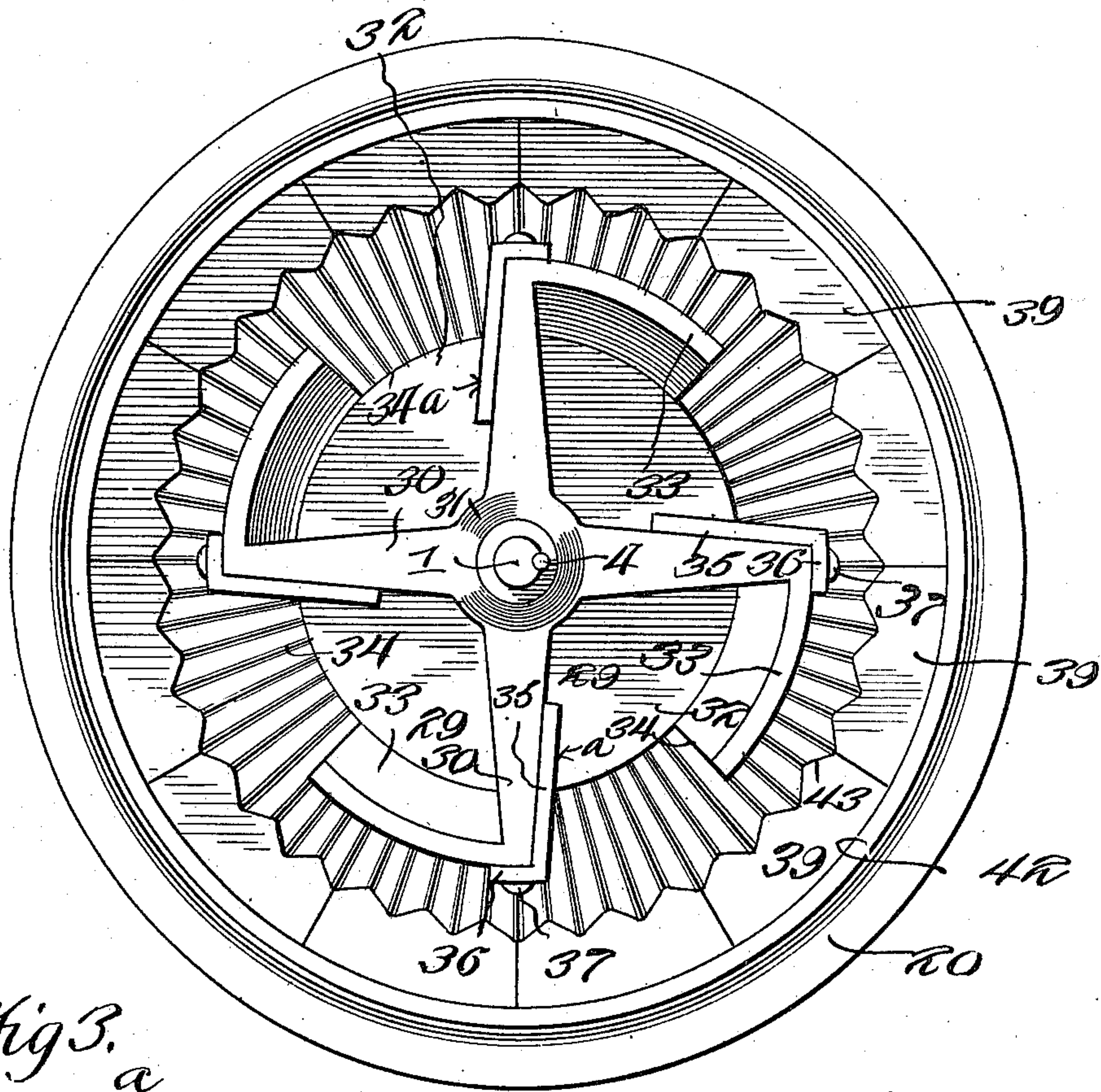


Fig 3.

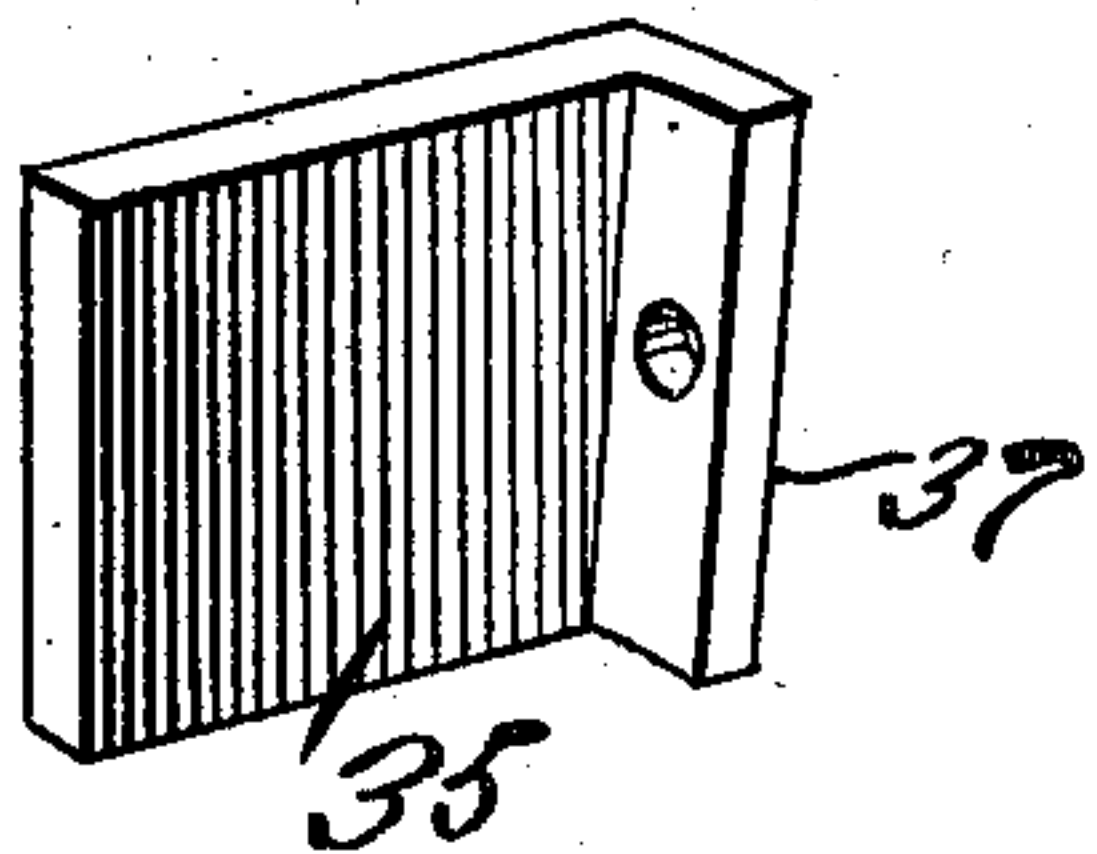
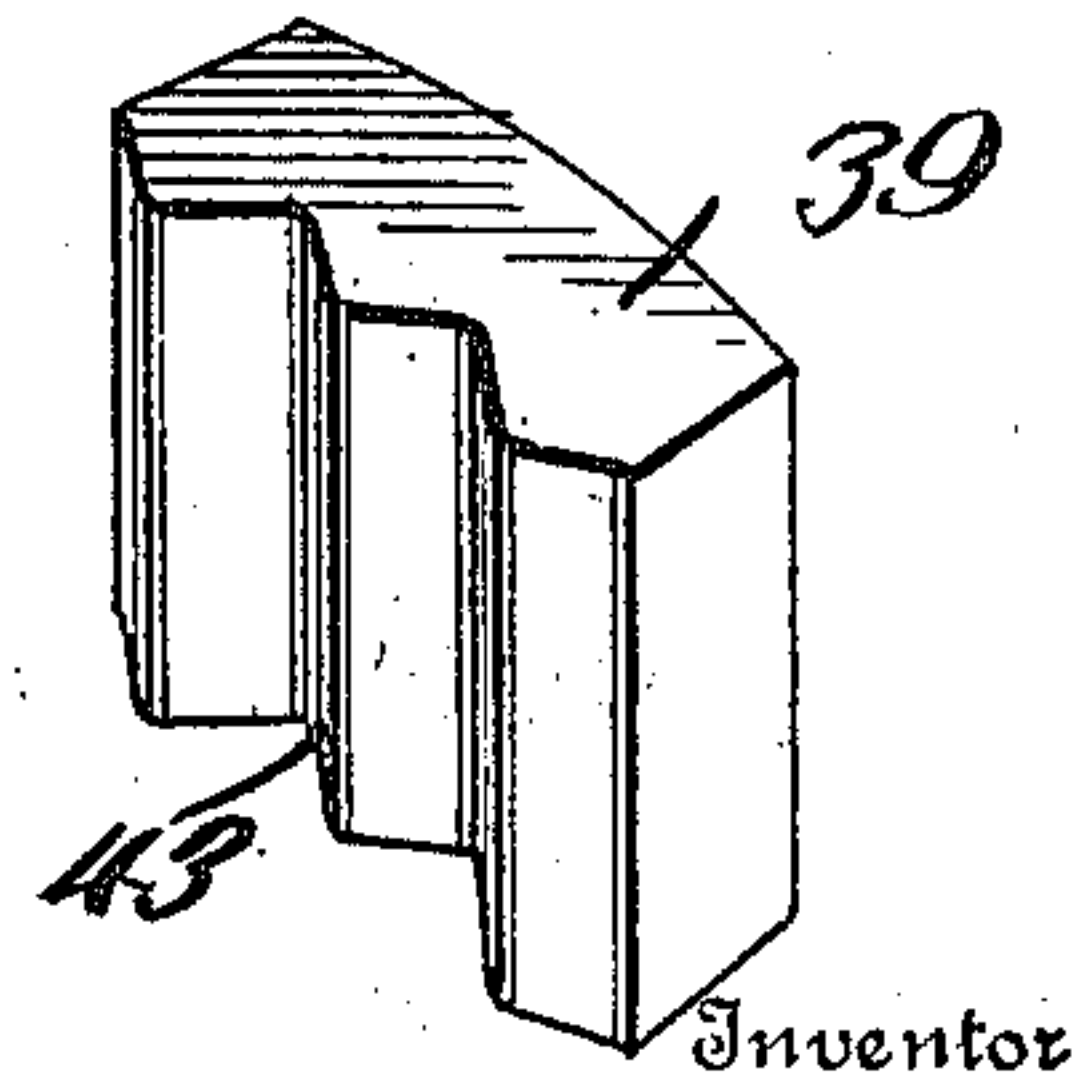


Fig 4.



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UNITED STATES PATENT OFFICE.

ELMER PRESTON GORDON, OF DENVER, COLORADO.

CENTRIFUGAL PULVERIZER.

964,102.

Specification of Letters Patent.

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Application filed November 28, 1908. Serial No. 464,874.

To all whom it may concern:

Be it known that I, ELMER PRESTON GORDON, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented new and useful Improvements in Centrifugal Pulverizers, of which the following is a specification.

This invention relates to a pulverizing machine of the centrifugal type designed for the purpose of crushing ore, rock, or other substances.

The invention has for one of its objects to improve and simplify the construction and operation of apparatus of this character so as to be comparatively simple and inexpensive to manufacture, and reliable and efficient in use.

Another object of the invention is the provision of a pulverizer comprising oppositely-rotated inner and outer sections of novel design for effectively pulverizing the material, and mounted within a casing having supply pipes through which the material is delivered to the elements, and also provided with discharge pipes whereby the pulverized material is conducted away.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claim appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a central vertical section of the machine. Fig. 2 is a plan view thereof with the cover removed. Fig. 3 is a perspective view of one of the shoes on the inner pulverizing element. Fig. 4 is a perspective view of one of the lining plates for the outer element.

Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawings, A and B designate, respectively, the outer and inner pulverizing elements nested one within the other and mounted for relative rotation. The outer element is in the form of a bowl-shaped casting which has a vertical passage 1 for accommodating the driving shaft 2 that has its upper end extending through a passage 3 in the inner section or element B, and the shaft and said element are secured

together by a key 4. The element A is formed with a chamber 5 in which the inner section B is disposed and in the bottom of the chamber is an annular groove 6 concentric with the shaft 1 for receiving anti-friction balls 7 that engage in an annular groove 8 arranged in the bottom surface of the inner section opposite the groove 6. In the body of the section A is a hollow centrally-disposed boss 9 on which is secured a pulley 10 whereby the outer section or pulverizing element A is rotated.

A hollow hemispherical base C constitutes a support for the working parts of the machine and this base has a central passage 11 for receiving the driving shaft 2, and keyed to the lower end of the shaft is a pulley 12 which is smaller than the pulley 10 and is adapted to be driven by a straight belt while the pulley 10 is adapted to be driven by a cross belt so as to rotate the inner and outer elements A and B in opposite directions, and the latter at greater speed, the base C being provided with an opening 13 at one side through which the straight belt for the pulley 12 extends. In the top of the base is an annular groove 14 arranged concentrically around the shaft 2 for receiving anti-friction balls 15, which balls also engage in an annular groove 16 in the bottom surface of the boss 9.

The pulverizing elements are arranged within a housing or casing D that consists of a cylindrical body 17 and an arched cover plate 18 which has its edge formed into a depending peripheral flange 19 that engages around an annular outstanding flange 20 on the body 17, and this cover is secured to the said flange by bolts 21. The cover 18 is provided with openings 22 for receiving the lower ends of supply pipes 23 that deliver the material to be pulverized to the pulverizing elements. The bottom portion of the outer section or element A projects out of the bottom of the casing and on the casing is a ring 24 which fits into an annular groove 25 in the element A to thereby form a tight joint so as to prevent the finely pulverized material from working out. The casing D is equipped with one or more discharge spouts or pipes 26 that flare outwardly therefrom and serve to conduct the pulverized material away from the machine and deliver it into suitable receptacles or bins. The pulverized material passes from the chamber 5 of the inner element through

downwardly inclined ports 28 in the body to the chamber 27 formed by the casing D of the element A. The casing D and pipes connected therewith are held stationary and
5 are supported in any suitable manner.

The inner section or element B is provided with a plurality of sector-shaped pockets 29 which are opened at the top and arranged under the pipes 23 to receive the
10 material therefrom and these pockets are separated by radial ribs 30 that are integrally connected with the hub 31 and with the annular base plate or disk 32. The pockets 29 are partially closed at the sides
15 by arcuate webs 33 connected with the ends of the ribs 30 and with the peripheral edge of the disk 32, and between each rib and the free end of the web 33 on the adjacent rib is a discharge opening 34 through
20 which the material is thrown by centrifugal force. The webs 33 flare upwardly to cooperate with the outer element to obtain an efficient pulverizing action. L-shaped shoes *a* of hardened steel or other suitable metal
25 are fastened to the ribs 30, each shoe having a plate portion 35 presented to one side of its respective rib 30 and bearing on the top face of the disk 32, and formed on the end of the plate portion is an inclined flange
30 36 that engages over the outer face of the adjacent web 33, the shoe being secured in place by a screw bolt 37 or other fastening. These shoes can be conveniently removed when they are worn away and new ones
35 substituted.

The outer section A is provided with a lining composed of hard steel or other metal segments 39 that rest on an annular ledge 40 disposed in the same horizontal
40 plane with the top surface of the disk 32 and these segments are disposed in a ring around that part of the inner section that is provided with the shoes *a* and the segments are secured in place by screws or other fastenings 41 that pass through the annular
45 flange 42 on the element A and screw into the said segments. These segments have corrugated inner faces 43 that cooperate with the shoes to effectively pulverize the
50 material and the inner concave face of the element A is corrugated at 44.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily
55 apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus
60 which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the
65 claim appended hereto.

Having thus described the invention, what I claim is:—

In an apparatus of the class described, the combination of a bowl-shaped rotary element having a central vertical passage and
70 provided with outwardly-inclined discharging ports, there being an annular shoulder extending around the inside of the bowl, the internal surface of the bowl below the shoulder being concave and corrugated, an
75 annular lining in said element arranged on the said shoulder, a shaft extending vertically through the passage of the bowl-shaped element, means for rotatably supporting
80 the shaft, a rotary pulverizing element secured to the shaft and disposed within the bowl-shaped element, said pulverizing element having a bottom portion provided with corrugations disposed opposite the first mentioned
85 corrugations, pockets formed in the top of said pulverizing element, ribs separating the pockets, arcuate upwardly flaring webs on the outer ends of the ribs arranged at an inclination to the axis of rotation, L-shaped shoes covering the faces of said ribs,
90 and fastened to the latter, means for rotating the elements independently, a casing surrounding the elements, a cover secured to the casing and suitable pipes communicating with said casing for supplying material to
95 the interior of the pulverizing element.

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

ELMER PRESTON GORDON.

Witnesses:

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