O. GERLACH.

PULVERIZER.

APPLICATION FILED MAY 16, 1914.

1,169,075. Patented Jan. 18, 1916.

Fig. 1.

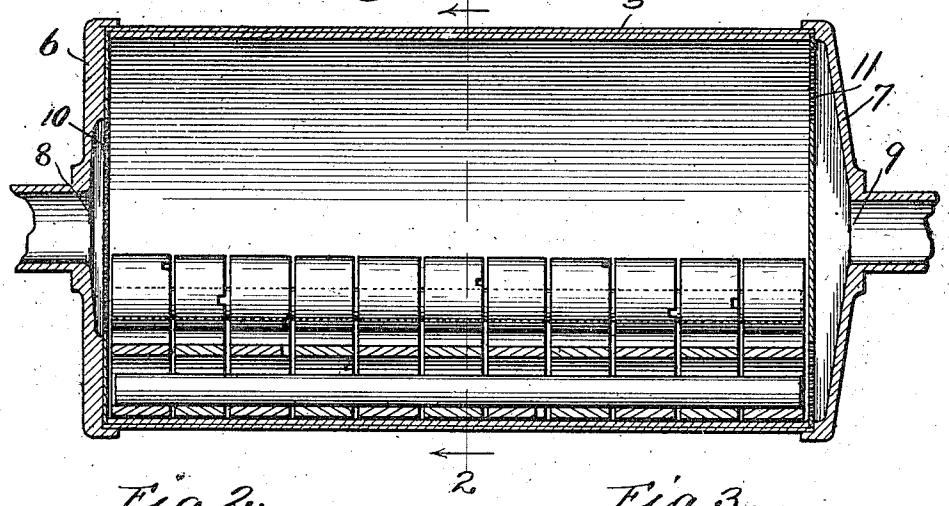


Fig. 2.

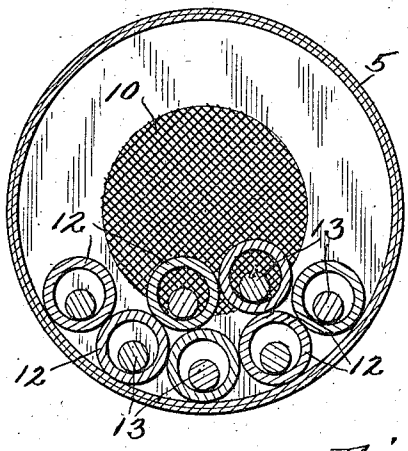


Fig. 3.

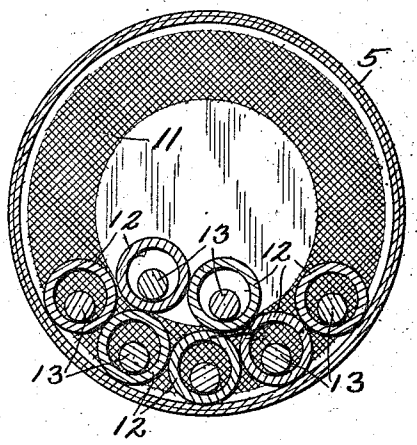
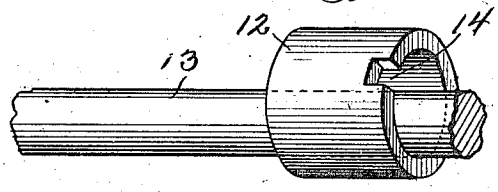


Fig. 4.



Witnesses:
R. J. Jacker
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UNITED STATES PATENT OFFICE.

OSCAR GERLACH, OF LA SALLE, ILLINOIS.

PULVERIZER.

1,169,075. Specification of Letters Patent. Patented Jan. 18, 1916.

Application filed May 18, 1914. Serial No. 839,202.

To all whom it may concern:

Be it known that I, OSCAR GERLACH, a subject of the Emperor of Germany, residing at La Salle, in the county of La Salle and State of Illinois, have invented a new and useful Pulverizer, of which the following is a specification.

My invention relates to pulverizers in which a series of tumblers or crushing elements fall around by gravity within a suitable container, and the objects of my improvements are, first, to increase the capacity of the output without enlarging the container; second, to provide a series of crushing rings and means for retaining the same in alinement in prearranged groups; third, to make a simple, strong and durable device and other features to become apparent from the description to follow.

In pulverizers it is desirable and practically necessary for efficient work, to have the tumblers or crushing elements of sufficient weight to reduce the coarser particles to the desired fineness and in my improved device the construction is such that a greater weight will automatically be brought to bear on the coarser particles, thus automatically bringing about a very desirable result.

The pulverizer comprises a cylindrical container and a plurality of tumbling rings arranged in groups within the same. Each series or group of rings is threaded or strung upon a suitable shaft which is small enough to have considerable play in the rings of the series or groups so that the individual rings of any series or group are free to move in all directions individually while being retained in its particular series or group by the shaft upon which it is strung.

To describe my invention so that others versed in the art to which it pertains can make and use the same I have illustrated it on the accompanying sheet of drawing forming a part of this specification and in which:

Figure 1 is a longitudinal sectional view of a pulverizer embodying my invention; Fig. 2 is a cross sectional view taken on line 2—2 viewed in the direction indicated by the arrows; Fig. 3 is a similar view but viewed in the opposite direction; and Fig. 4 is a detail perspective view showing a single ring on its shaft removed from the container.

Similar reference characters refer to similar parts throughout the several views.

The container 5 is made of any desired size and is preferably cylindrical in form having the heads 6 and 7 closing its ends. The head 6 at the intake end is provided with the central opening 8 through which the material to be pulverized is fed by any special feeding mechanism not shown. The head 7 at the discharge end is provided with the central opening 9 through which the finished pulverized material is discharged. Suitable screens 10 and 11 are provided at the inlet and discharge ends of the container 5 respectively. The screen 10 at the intake end has its perforations near the center as clearly indicated in Fig. 2, and the screen 11 at the discharge end has its perforations remote from the center as clearly indicated in Fig. 3. The parts thus far described form no part of my invention and can be of any desired construction.

Within the container 5 are placed a plurality of groups or series of crushing tumblers, each group or series comprising a plurality of rings 12 which are strung on a shaft 13. The shaft 13 is of such length that it is free to tumble about within the container 5 between the screens 10 and 11 and have a slight play endwise therebetween.

The inner wall of the cylindrical container 5 being straight longitudinally and each of the shafts 13 being straight longitudinally and each of the rings 12 being flat having a straight longitudinal surface, the shaft 13 of each group will rest equally on each ring 12 of its group and each ring 12 will rest or be supported on the inner wall of the container 5, when the interior of the container 5 is free of all material to be pulverized; but as material is fed into the container 5, while the same is being rotated on its axis, and lodges under any one of the rings 12, it is clear that said ring will be slightly lifted against the force of gravity by the said material, and the lifting of the ring will naturally result in lifting its coöperating shaft. Thus it will be understood that the largest particles of material which lodge between the rings 12 and the inner wall of container 5 will be subjected to the combined weight of a ring 12 and a greater or less part of a shaft 13 depending on the location of the ring with respect to the center of the

shaft; *i. e.*, if the ring is located at the center of the shaft practically the whole weight of the shaft will be applied as a crushing force on the material, and if the ring is located at one end of the shaft only one half of the weight of the shaft will be applied as a crushing force on the material. Of course the weight of the ring is always applied as a crushing force on all material which passes between the ring and the inner wall of the container 5.

Some material while being fed through container 5 will lodge within the rings 12 and will be crushed by the weight of the shaft 13 which extends through the entire group or series of rings. I preferably place such a plurality of groups of rings and shafts within the container 5 that more than one layer of such groups will be contained therein and they will necessarily pile on top of each other as the container is rotated in a fashion similar to that shown in Figs. 2 and 3. Thus a multiplicity of material crushing elements is afforded, which results in a very efficient apparatus. Each ring 12 is preferably provided with a notch or perforation 14 to facilitate the feeding of the material to be crushed underneath the different crushing elements.

It will be understood that the inner wall of the container 5 and the outer surfaces of the rings 12 may take a form other than flat; and the several parts may be modified in size and shape without in the least departing from the scope of my invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a device of the class described, a cylindrical container, a plurality of groups of tumblers within said container, held in contact with each other by force of gravity, each of said groups comprising a plurality of rings and a shaft extending through said rings to retain them in a group and permit their free individual movement about the shaft.

2. In a device of the class described, a cylindrical container, a plurality of groups of tumblers within said container held in contact with each other by force of gravity, each of said groups comprising a plurality of rings each having a notch in one edge and a shaft extending through said rings to retain them in a group and permit their free individual movement about the shaft.

3. In a device of the class described, a cylindrical container arranged to rotate on its axis, a plurality of shafts within said container extending parallel to the axis of the container from end to end thereof and free to tumble about therein, and a plurality of flat rings strung upon each of said shafts.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 29th day of April, 1914, at Danville, Illinois.

O. GERLACH.

Witnesses:
H. E. ERCANBRACK,
F. R. BAUKHAGE.