(No Model.)

M. GOLDING.

PULVERIZING APPARATUS.

No. 246,751. Patented Sept. 6, 1881.

FIG. 1

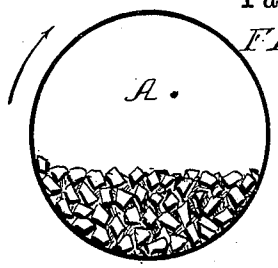


FIG. 2.

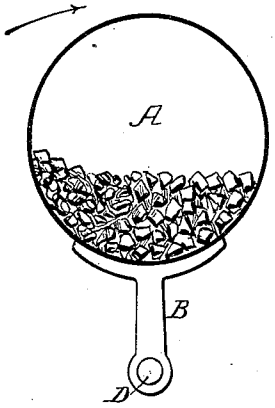


FIG. 3.

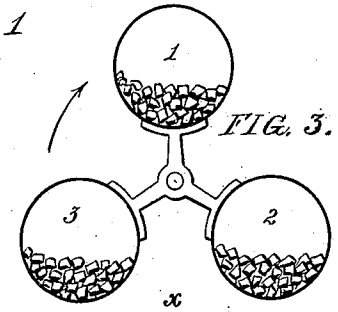


FIG. 4.

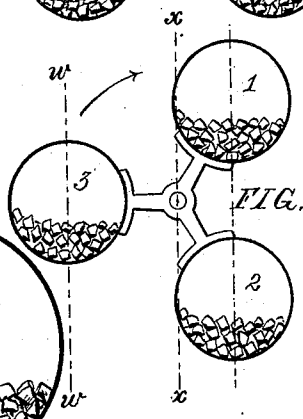


FIG. 6.

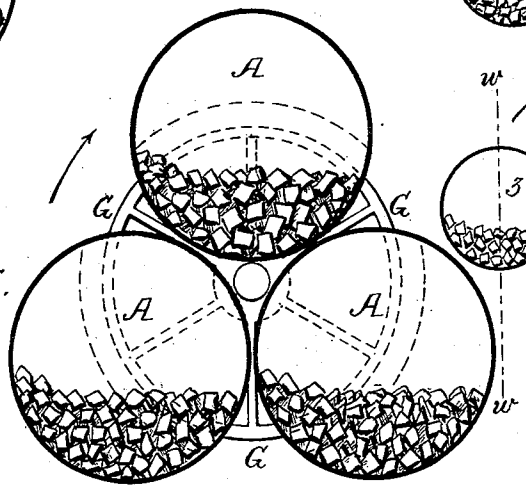
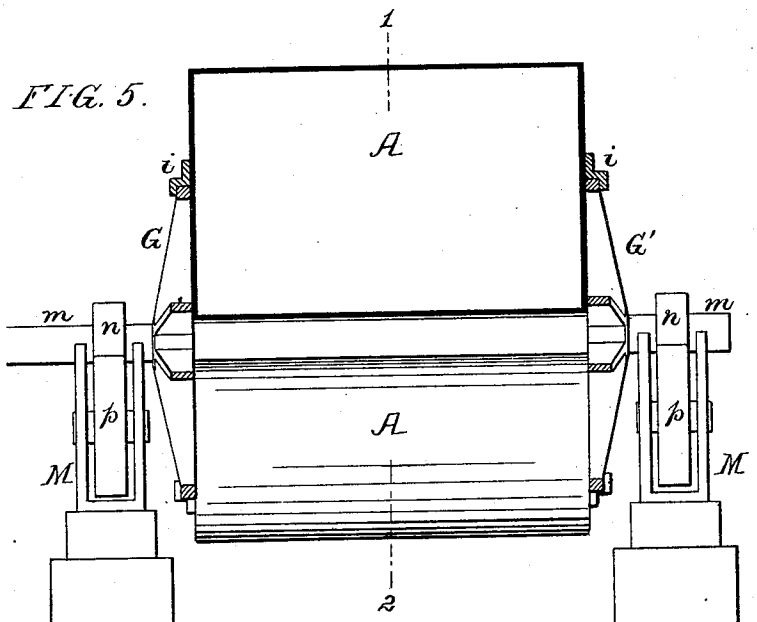


FIG. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

MOSES GOLDING, OF TRENTON, NEW JERSEY.

PULVERIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 246,751, dated September 6, 1881.

Application filed April 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, MOSES GOLDING, a citizen of the United States, residing in Trenton, New Jersey, have invented an Improvement in Pulverizing Apparatus, of which the following is a specification.

My invention relates to that class of pulverizing or abrading machines in which the material to be acted upon is agitated in rotating cylinders or other shaped receptacles; and my invention consists in combining two or more cylinders or receptacles containing the material to be pulverized or abraded, and having no communication with each other, with two journals having a common axis, round which the cylinders can revolve without turning on their own axes, all as fully described hereinafter, the object of my invention being to obtain a pulverizing and abrading effect on large masses of material at the expense of a limited amount of power compared with that required to produce the same effect by ordinary machines of the class to which my invention relates.

In the accompanying drawings, Figures 1, 2, 3, and 4 are diagrams illustrative of my invention; Fig. 5, a sectional view of the pulverizing or abrading machine, and Fig. 6 a transverse section on the line 1 2.

It may be advisable in the outset to explain the operation of my invention by comparing it with that of ordinary machines to which it relates.

An ordinary pulverizing or abrading machine may be described by reference to Fig. 1, in which A is a hollow cylinder of substantial material, either wood or metal, or metal lined with wood, as in the Patent No. 221,548, granted to me November 11, 1879, the cylinder having central journals adapted to fixed bearings.

The material to be pulverized—quartz to be used in the manufacture of pottery, for instance—is placed in the cylinder, together with stones of a hard flinty character. As the cylinder revolves—say in the direction of the arrow—there are two influences at work, one tending to drag the material in the direction in which the cylinder turns, and the other, due to the gravity of the material itself, which tends to retain it at the lowest part of the cylinder. Under these contradictory influences there must be such an agitation of the mass in the cylinder that a constant abrasion against each other of the quartz and flint must take place, and the quartz, being the softest, will be triturated. The same plan is adopted in cleaning castings, which, being placed in the cylinder, must be subjected to mutual abrasion as the cylinder revolves.

If the cylinder A is attached to an arm, B, secured to a shaft, D, so as to be carried round with the shaft without rotating on its own axis, as shown in Fig. 2, there will be the same amount of agitation of the material and the same triturating effect during one revolution of the said shaft D as the same material would receive in the cylinder, Fig. 1, during one revolution of the same on its own axis; but this plan would be out of the question, as the power to drive the shaft which carries the cylinder would vary at different points in a revolution, and this would be equivalent to a demand for much more power than would be required to rotate the cylinder, Fig. 1, on its own axis; but if three cylinders, 1, 2, and 3, are arranged in a group, Fig. 3, on three arms secured to a central shaft at equal distances therefrom and at equal distances apart circumferentially, the case will be different, for it will be seen, on reference to that figure, that the cylinder 2 and its contents balance the cylinder 3, the cylinder 1 and its contents being in a neutral position where their weight can exert no influence in either direction. If the three combined cylinders be moved in the direction of the arrow to the extent of one-twelfth of a revolution they will occupy the position shown in Fig. 4, and there will be the greater weight of the cylinders 1 and 2 and their contents on one side of the line *x x*, drawn vertically through the axis of the shaft, than on the opposite side where there is but one cylinder, 3; but the weight of the latter (indicated by the line *w w*) is so much farther from the line *x x* than the weight of the two cylinders 1 and 2 that the single cylinder will balance the two cylinders, and the combined cylinders will be balanced, or nearly so, no matter what position they may occupy, providing all are loaded alike. The combined cylinders being thus balanced, a much greater quantity of material can be pulverized at a less expense of power than by the use of cylinders turning on their own axes, for it must be remembered that the effort required to agitate the contents of a single cylinder turn-

ing on its own axis is equivalent to that of continuously raising a heavy weight with nothing to balance or lessen the effort of raising that weight, as in the case of the three cylinders on an axis common to all.

In carrying my invention into practical effect I prefer the plan shown in the longitudinal and transverse sections, Figs. 5 and 6, in which G G′ are two flanged disks, each provided with a journal, *m*.

On each end of each cylinder is secured a flanged plate, I, and the plate at one end of each cylinder is bolted to one flanged disk, G, the plate at the opposite end of each cylinder being bolted to the flanged disk G′, so that the whole form a secure self-contained structure, of which *m m* are the two journals, collars *n* on these journals bearing on anti-friction rollers *p*, carried by suitable standards, M M, secured to appropriate foundations.

It has not been deemed necessary to show the appliances for rotating the structure, or the lining of the cylinder, which may be the same as that for which Letters Patent No. 221,548 were granted to me November 11, 1879. It will be understood that suitable provision must be made for introducing the material to be pulverized into each cylinder and for withdrawing the powder therefrom.

It may be remarked that a structure composed of two cylinders arranged on opposite sides of an axis common to both will, in a measure, attain the object aimed at, and that more than three cylinders may be used; but I prefer the group of three cylinders arranged in the manner described.

In using the word "cylinder" I intend it to apply to receptacles which may be many-sided, as in constructing what are known as "tumbling-boxes" for cleaning castings.

I claim as my invention—

A pulverizing or abrading machine in which two or more hollow cylinders or receptacles for containing the material to be pulverized or abraded and having no communication with each other are combined with two journals having a common axis, round which the cylinders can be rotated without turning on their own axes, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MOSES GOLDING.

Witnesses:
EDWARD KURTZ,
JAMES SCHOOLEY.