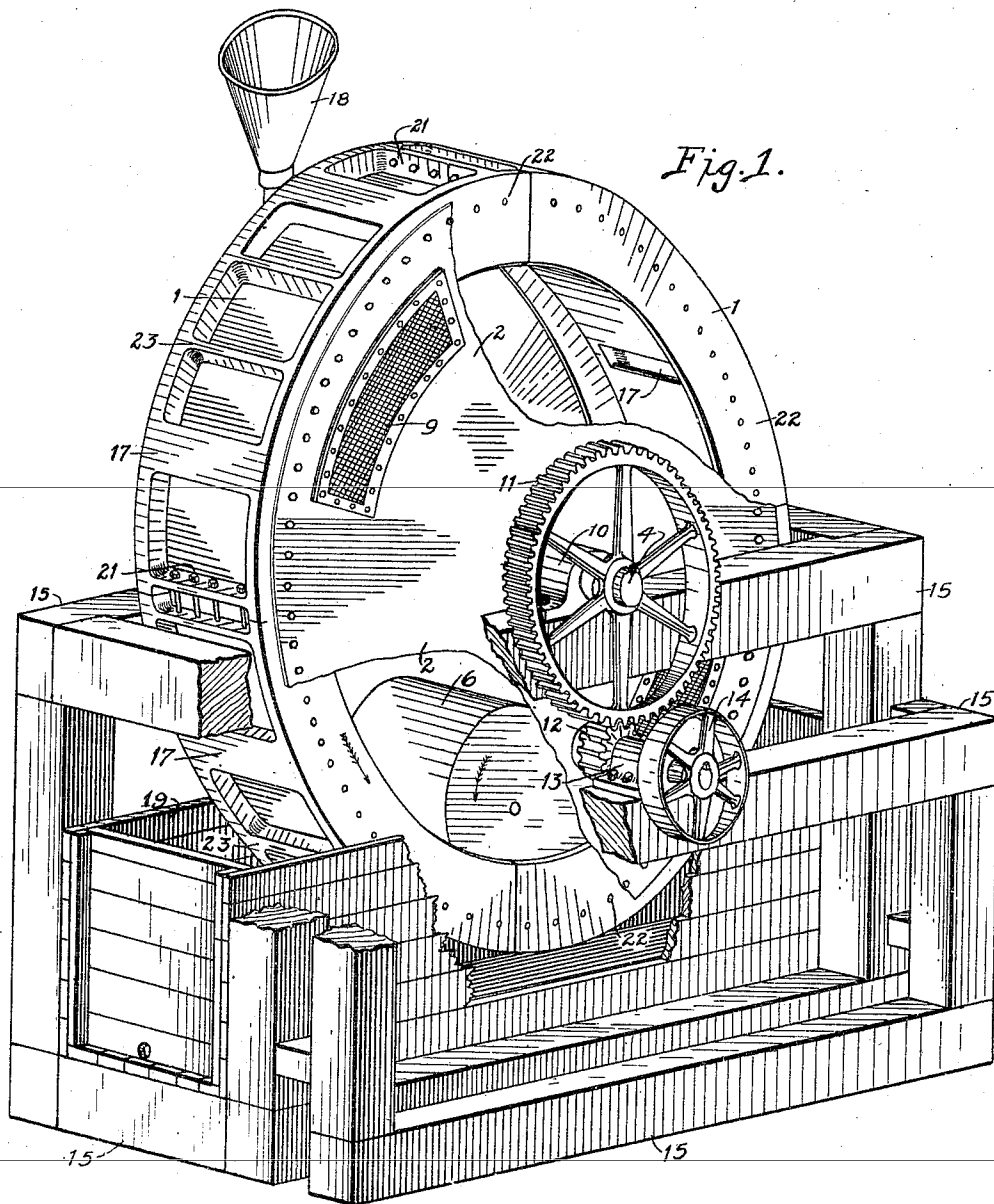


J. G. KIRKSEY.
ORE GRANULATOR.
APPLICATION FILED FEB. 14, 1911.

994,934.

Patented June 13, 1911.
3 SHEETS—SHEET 1.



WITNESSES:

Milton C. Shedd
Daniel A. Evans

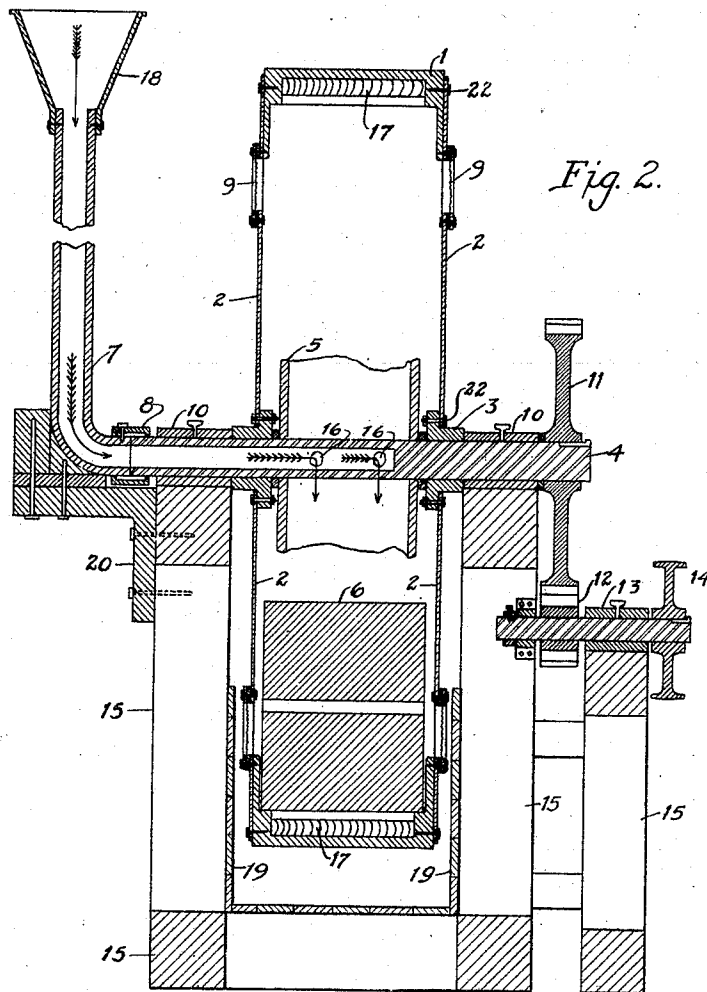
John G. Kirksey.
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3 SHEETS-SHEET 2.



WITNESSES:

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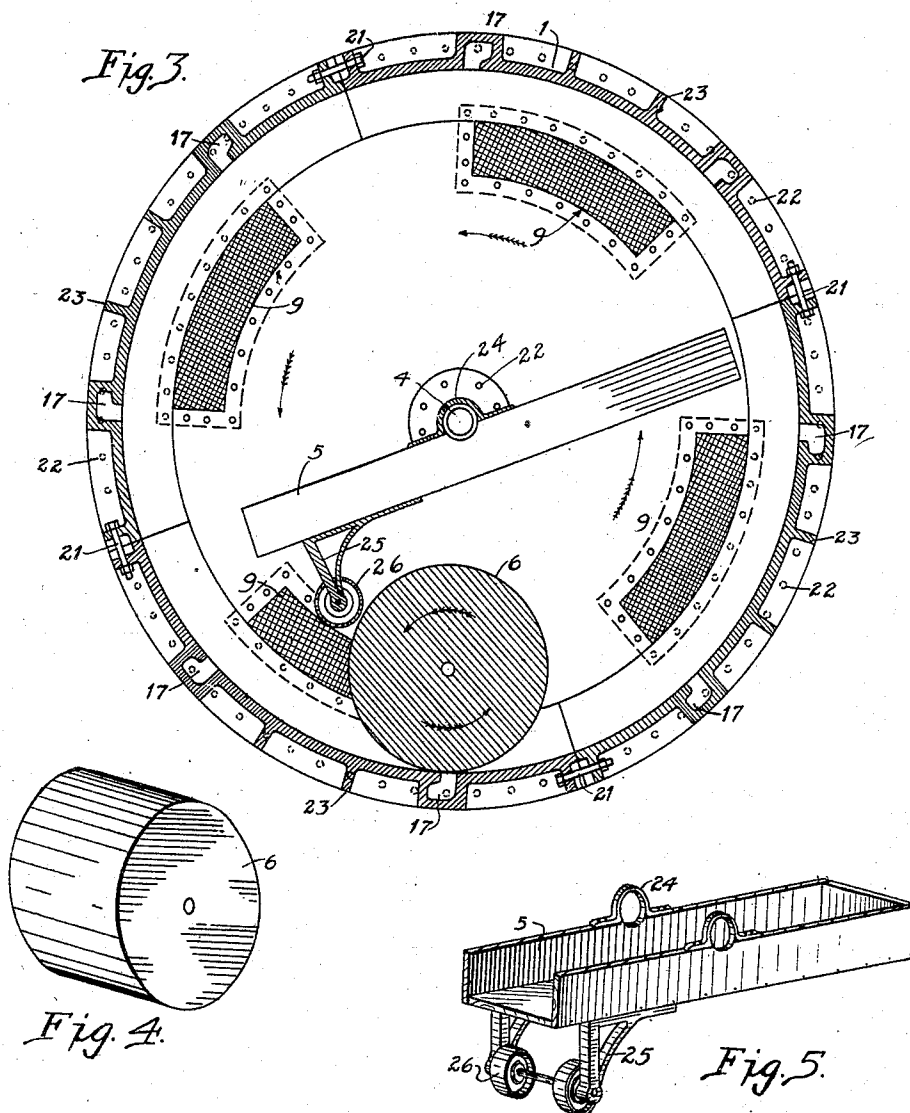
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UNITED STATES PATENT OFFICE.

JOHN GIDEON KIRKSEY, OF DENVER, COLORADO.

ORE-GRANULATOR.

994,934.

Specification of Letters Patent. Patented June 13, 1911.

Application filed February 14, 1911. Serial No. 608,535.

To all whom it may concern:

Be it known that I, JOHN G. KIRKSEY, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Ore-Granulators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved ore granulator by which the crushed ore (of, say one inch and less in size) as it comes from the crusher, is commingled with water and passed under a head pressure to the interior of a revoluble wheel and delivered in front of a very heavy crushing body, revolving synchronically with said wheel upon an inner circumferential track provided with spaced buckets, the purpose of these buckets being to carry up and deliver in front of said crushing body and onto the body of water carried ahead of said crushing body, the comminuted material, where it will be washed transversely through the screens, or if too coarse to pass through the screens, it will sink and be again passed over and ground finer by the crushing body.

The objects of the invention are, to granulate with little power and with little wear of parts and little or no friction, a large tonnage per day, and at little cost of installation, and to avoid the sliming of so much of the ore, as with other processes, embodying great friction and wear, and power to operate.

My invention is further explained by reference to the accompanying drawings, in which:—

Figure 1 represents a perspective view of the machine with certain parts broken out. Fig. 2 is a vertical cross-sectional view through the center of Fig. 1. Fig. 3 is a horizontal cross-sectional view on and near a center line of the wheel 1. Fig. 4 is a perspective view of the crushing cylinder. Fig. 5 is a perspective view of the trough or sluice-way 5.

In the embodiment illustrated, the large hollow rotatable wheel is made up of a heavy rim, 1, with flanged sides, made preferably of cast iron, and forming an inner track or race, whereon the heavy crushing cylinder, 6, revolves; to this rim, 1, and the flanged members, 3, carried on the axle, 4, are bolted the plates, 2, preferably of sheet steel; these

plates, 2, secured by bolts, 22, being provided with screen openings, over which are bolted the screens, 9. The shaft, 4, is partly hollowed, and connects at the packing sleeve, 8, with a vertical pipe, 7, of the same size duct, and with the hopper, 18, and through which the material and water is fed under pressure to the interior of the hollow rotatable wheel through outlet holes, 16, in said axle. The inner track of said hollow rotatable wheel is provided with spaced depressions forming buckets, 17, designed to carry up and deliver onto the body of water in front of the crushing cylinder the ground ore over which the crushing cylinder has passed where it will be washed transversely through the screens, 9, and out into the box, 19.

Carried within and on the axle, 4, is a trough, 5, with straps, 24, and which contacts with the cylinder, 6, through wheels, 26, mounted in frame, 25, attached to said trough; the proper inclination of this trough being thus preserved—the inflowing material and water through inlets, 16, as well as the elevated material and some water, is caused to be delivered immediately in front of the revolving cylinder, 6, thus preventing the accumulation of material and water in the rear of the cylinder, as would otherwise be the case and thus destroy the efficiency of the machine. This hollow rotatable wheel is mounted in bearings, 10, fastened to the suitable framework, 15, and is made to rotate through the drive pulley, 14, and the pinion, 12, connecting with the gear wheel, 11, carried on the projecting axle, 4. The outer rim of this hollow rotatable wheel is provided with supporting flanges, 23, which connect with the side flanges, thus giving additional support to the rim and inner track.

In operation, the material, previously crushed to, say three-fourths inch maximum size, is fed into the elevated hopper, 18, together with a large volume of water, and by reason of this proper head pressure, the material is driven, without clogging, through the pipe and connecting axle duct and out through the holes, 16, into the interior of the hollow rotatable wheel and into the inclined trough, 5, which delivers it in front of the crushing cylinder, 6, which revolves synchronically with the hollow rotatable wheel and track of same. The material and some water over which this crushing mem-

ber has passed finds its way into the elevating buckets, 17, and is carried up and again delivered in front of the cylinder, 6, and onto the body of water pushed ahead of this cylinder, where it is transversely washed through the spaced screens on each side of the hollow rotatable wheel, and any material not crushed to a fineness to pass through the screens would find its way again under this crushing member. The comminuted material thus passing the screens would be delivered into box, 19, and from thence to other machines for treatment. In this construction, there is presented a practically continuous wide track with a very heavy crushing cylinder to fit endwise with said track, and revoluble on said track and spaced buckets in said track for keeping the underground material successively passing under this crushing cylinder, until ground to a fineness that it will pass out the screens, thus producing a product in a granular form, instead of being largely slimes; it being also apparent that but little friction, and hence little wear of track or cylinder is presented. The disposition of these elevating buckets at spaced intervals around the track comprises one of the novel features of this machine, and is absolutely essential to the success of the same; as otherwise the material, some of which, perhaps, would be only partially ground, would find lodgment behind the wheel and wholly impair its operation.

From the foregoing description, it will be seen that this apparatus is a simple construction, and combines all the elements necessary for an efficient pulverizer, and the construction permits the parts to be assembled with the liability of derangement and wear reduced to a minimum.

I claim as my invention:—

In an ore mill, the combination of a hollow rotatable wheel; a crushing cylinder freely mounted in said wheel; a hollow shaft on which said wheel is secured, said shaft having openings leading into said wheel; a trough loosely mounted on said shaft, with one end riding on said cylinder and adapted to discharge its contents in front of the same; the said wheel having on its inner face spaced pockets forming elevator buckets, extending transversely of the same and adapted to redeliver the material into said trough; a feed hopper communicating with said hollow shaft; said hollow wheel having screened outlets on its opposite side and mounted in a suitable frame work and means for rotating said wheel, substantially as described.

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

JOHN GIDEON KIRKSEY.

Witnesses:

MILTON C. SHEDD,
W. R. PIPER.