

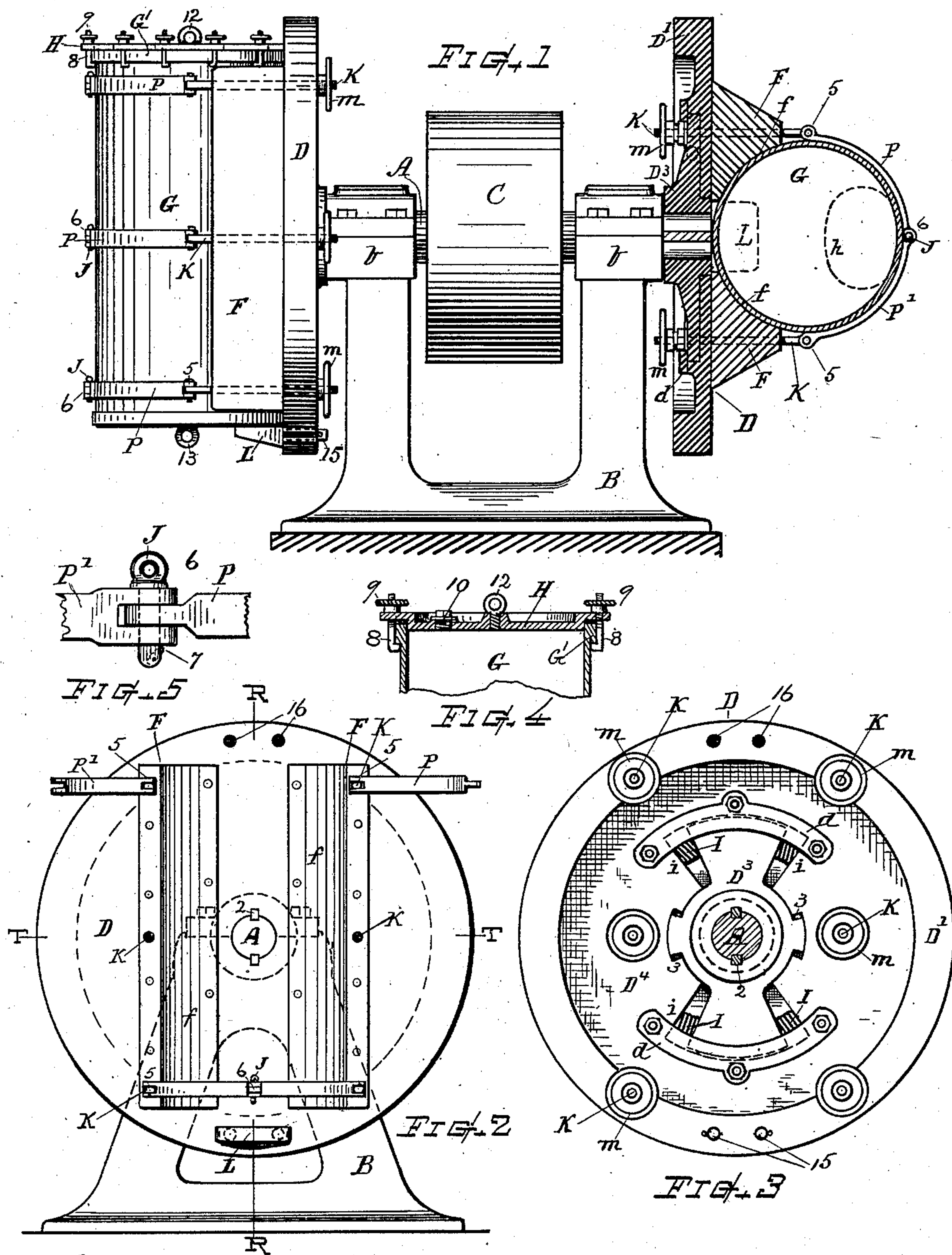
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MECHANISM FOR TREATING ORES.

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NO MODEL.



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MECHANISM FOR TREATING ORES.

SPECIFICATION forming part of Letters Patent No. 748,528, dated December 29, 1903.

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To all whom it may concern:

Be it known that I, GEORGE M. RICE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Mechanism for Treating Ores, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of this invention is to provide a simple and economical mechanism for the treatment of ores in amalgamating process by tumbling percussive operation and to render such mechanism capable of ready exchange and replacement of the charge-cylinders; also, to provide a mechanism for the purpose described which can be operated on large charges of ore with comparatively small expense in power and labor.

Another object is to provide for the purpose specified a mechanism having its charge-containing cylinders independently removable and adapted to be used in different positions of attachment upon their supporting-seats in order to afford a new line of travel for the ore charge, and thereby equalize the wear against the walls of the containing-cylinder. I attain these objects by the mechanism illustrated in the drawings, wherein—

Figure 1 is a part side part sectional view of a mechanism embodying my invention. Fig. 2 is an end view of the same with the charge-container removed. Fig. 3 is a back view of one of the head-wheels or carriers and showing a yielding means combined therewith. Fig. 4 is a transverse vertical section of the top of the container and its removable cover, and Fig. 5 is a front view of the clasp-arm ends.

In my improved mechanism as illustrated in the drawings the part marked A represents the shaft or axle, mounted to turn in bearings *b* upon a suitable supporting-frame B and provided with a gear, sprocket-wheel, or pulley C, whereby power and motion from any suitable source can be applied for operating the mechanism. Upon either end of the shaft there is mounted a carrier, frame, or head D, which is preferably formed as a wheel

with a heavy rim D' and a flat side part or disk face, whereon there is fixed oppositely-disposed seating-supporters F F, having shaped or hollowed faces *f*, that form a seating-cradle for receiving and sustaining the charge container or cylinder G, which is removably secured thereto by releasable fastening devices, as hereinafter described. The container G is adapted for inclosing and holding a charge of ore to be treated, together with rock-pebbles, water, mercury, &c., and to subject the same to efficient tumbling percussive action to effect the amalgamation and recovery of gold, this mechanism being one suitable for the working of the process set forth by me in another application for patent executed by me on even date herewith.

The head-wheels D, which may be some ten feet, more or less, in diameter, are keyed to the shaft, as at 2, or in other efficient manner, so as to rotate therewith, and the seating-cradles upon the respective head-wheels are preferably disposed so that the two container-cylinders G are carried thereon with their axes approximately parallel with the planes of the wheels and at right angles to each other, or with the axis of one cylinder disposed in the direction R R, (see Fig. 2,) while the axis of the other cylinder is disposed in the direction T T. This arrangement more uniformly distributes the inequalities in weight and action about the central axis and renders the operation steadier for the motive power than with the cylinders parallel with each other.

The head-wheels D may be of rigid or yielding construction. An example of the latter is shown in Fig. 3, where the wheel is formed with a central body member D³, fixed to the shaft A, and an outer or surrounding body member D⁴, mounted thereon to have limited rotative movement, the two members being retained together as a single wheel by suitable stays *d*. Strong springs I are arranged between arms or surfaces of the central member D³ and shoulders *i* on the outer member, as indicated. Offsets or stop-shoulders may be formed, as at 3, to positively limit the extent of yielding motion in either direction. The seating-cradle F for holding the cylinder G being attached to the outer or rim member and the power-shaft A being attached to the

inner body member, all sudden strains or shocks in the tumbling operation of the containers are partially cushioned by the springs I, and the driving belt or chain is thereby relieved of much strain that might otherwise come upon it.

K indicates screw-threaded draw-bolts arranged at the sides of the seating-cradle F and provided with operating-nuts *m*, having hand-wheel rims or means for effecting operation thereof.

P P' indicate clasp-arms hinged at 5 to the ends of the draw-bolts and adapted to embrace the circumferential surface of the container G. The ends of the clasp-arms P P' are best fitted to interlock or be secured together at 6 by a detachable joint-pin J, (see Fig. 5,) which is inserted through the parts and which is best provided with a spring guard-lug 7 to prevent its escape. The clasp-arms can be opened, as shown at the upper part of Fig. 2, and then closed about the cylinder after the latter has been placed against the cradle, the lock-pin J being then inserted therein. Then by the hand-wheel nuts *m* the clasps can be drawn firmly down to place for binding or clamping the container-cylinder securely in position upon the cradle-seat F, the surfaces *f f* of which afford frictional resistance sufficient for retaining the container in place upon the head-wheel D while in operation.

The container G is preferably a cylinder made of comparatively heavy plate-steel and of any suitable size—say about nine feet in length by five feet diameter, more or less, or other dimensions. It has a solid bottom end, while the top end is furnished with a close-fitting cover or end plate H, secured in place by grab-bolts 8, that engage the overhanging edge of the reinforce-rim G' and are made fast by screw-clamp nuts 9 or by other securing means whereby an absolutely tight closure and facility for opening can be attained. In some cases instead of making the entire end of the cylinder as a cover the end can be fixed and a manhole and cover arranged therein, as indicated by the dotted line *h* on Fig. 1. A removable plug 10, arranged as in Fig. 4, affords access to the interior without releasing the entire cover or end closure. Loops or eyebolts 12 and 13, arranged on the cover and bottom end of the container, afford facility for attaching the hook of a derrick or hoist for handling the container in shifting it to and from its position on the head-wheels.

L indicates a lug or step for resting the cylinder upon the head-wheel D. Said step is removably attached to the wheel by dowels 15, adapted for insertion through holes 16, formed in the rim D' or body of the wheel. The step can be removed or used at either edge of the head-wheel as desired, so that it will aid in placing the cylinder whichever

part of the wheel may be upmost at the time being.

The mechanism may in some instances be employed with but one head-wheel; but I prefer to employ a head-wheel at each end of the shaft, since such dual arrangement gives better balance and greater capacity without greatly increasing the cost of maintenance and running expenses.

In the operation fine ore, rock-pebbles, and water are charged into the cylinder, which is secured upon the head-wheel in the position indicated and action imparted thereto by rotation of the shaft, which effects an end-over-end tumbling of the cylinder, causing its contents to be dropped or thrown, with more or less violence, from end to end of the cylinder and giving a sharp percussive impact and grinding of the pebbles upon each other and the ore particles as the action proceeds.

The charge-containers being made as removable steel cylinders and the seating-cradles and fastening devices being arranged for holding said cylinders in the manner described, I am enabled to adjust the cylinders in relation to their seats, so as to bring any part of their shell into alinement with the planes of revolution, thus distributing the wear of the ore contents upon all sides of the interior surface and rendering the containers more durable and economical than would otherwise be the case. Also the containers can be shifted and exchanged for charging and emptying or for any other purpose when desired. In practice a reserve cylinder may be used, so that one cylinder can be in process of emptying and recharging while the mechanism is in operation and then exchanged for one of the cylinders upon the machine with only a brief stopping of the mechanism.

What I claim, and desire to secure by Letters Patent, is—

1. A machine for the purpose specified, comprising a rotatable shaft, supporting-bearings therefor, an operating wheel or pulley fixed on said shaft between the bearings, a heavy-rimmed head-wheel mounted on each end of said shaft, hollow-faced supporters fixed upon the head-wheels and adapted for seating an ore-container cylinder thereon, the removable ore-container cylinders, clamping devices for the respective ends of said cylinders, comprising bands that clasp around the outer surface thereof and terminate in threaded draw-bolt portions confined in the wheel-rims, and screw-nuts on said draw-bolts for tightening and loosening said clamping devices.

2. In a machine for the purpose specified, the combination of a rotatable shaft, suitable bearings therefor, means on each end of said shaft for seating and supporting a container-cylinder, said seats respectively disposed for supporting the pair of cylinders with their

axes transverse to the shaft-axis, and in planes at right angle with each other, the removable container-cylinders mounted on said seats, and means for securing the cylinders in position.

5 3. In a machine for the purpose specified, and in combination with the operating-shaft and the container-cylinder; a head-wheel comprising a central member fast on said shaft and having projections or arms, a face portion or outer member capable of limited oscillatory movement thereon, the container-supporting seat arranged upon said outer member, and resistance-springs disposed between portions of said central member and said outer member for affording limited yielding action, for the purpose specified.

15 4. A mechanism for the purpose specified, comprising in combination, a supporting-frame provided with suitable bearings, the rotatable shaft mounted in said bearings, means for operating said shaft, a plurality of rotary yieldable carriers or head-wheels supported on said shaft, seat-cradles fixed to the outer member of said carriers with their respective axes disposed in opposite diametric planes in relation to the shaft-axis, yielding resistance devices between the seat-supporting members and the members fixed to the

operating-shaft, the removable charge-containing cylinders fitting to said seat-cradles, and means for securing said cylinders in place upon their seats.

5. In a mechanism for the purpose specified, in combination with the rotatable carrier or head-wheel, the seat-cradle thereon, and the removable ore-container cylinder adapted for resting on said seat; the swinging clasp-arms, means for uniting the front ends of said clasp-arms, threaded draw-bolts attached to said clasp-arms and tightening-nuts threaded on said draw-bolts, substantially as set forth.

6. In a machine for the purpose specified, in combination with the rotatable supporting-shaft, the head-wheel fixed thereon and having the rim portion, the seat-cradle on said wheel, and the removable cylinder; of the projecting lug-step supported on the wheel-rim and detachable for adjustment at either position on the wheel.

Witness my hand this 19th day of March, 1903.

GEORGE M. RICE.

Witnesses:

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