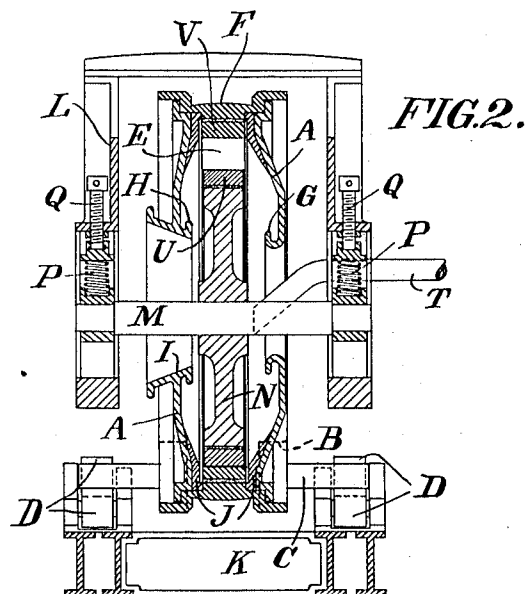
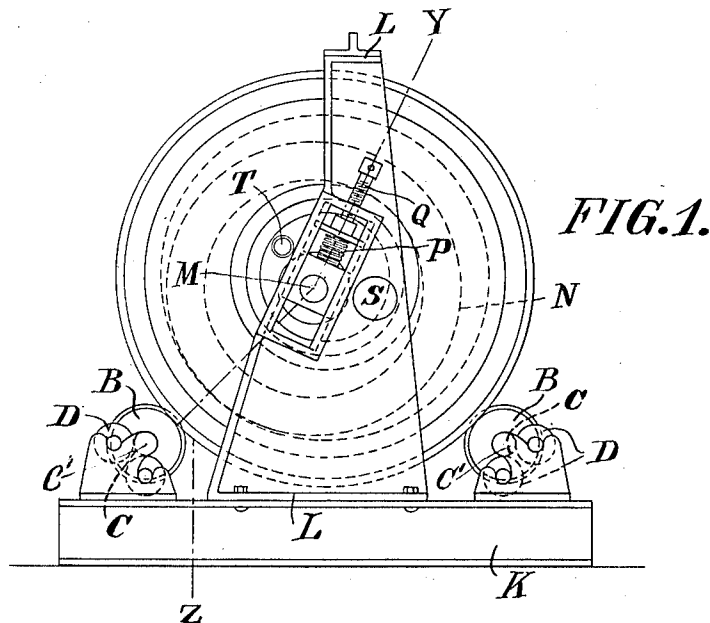


W. W. WRIGHT.
 APPARATUS FOR CRUSHING AND AMALGAMATING GOLD OR SILVER ORES.
 APPLICATION FILED DEC. 23, 1911.

1,051,795.

Patented Jan. 28, 1913.



Witnesses

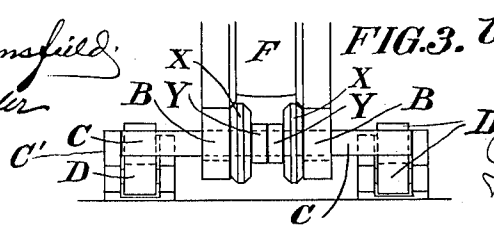
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UNITED STATES PATENT OFFICE.

WALTER W. WRIGHT, OF PANT RUABON, ENGLAND.

APPARATUS FOR CRUSHING AND AMALGAMATING GOLD OR SILVER ORES.

1,051,795.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed December 22, 1911. Serial No. 667,282.

To all whom it may concern:

Be it known that I, WALTER WILLIAMS WRIGHT, a subject of the King of Great Britain, residing in Pant Ruabon, in the county of Denbigh, in the Principality of Wales, England, have invented certain new and useful Improvements in or Relating to Apparatus for Crushing and Amalgamating Gold or Silver Ores, of which the following is a specification.

This invention has for its object primarily an apparatus for crushing and usually for amalgamating gold or silver ore, having all the advantages of an edge runner, a rolling mill, and an amalgamator or concentrator.

It is designed specially to be made portable, so that it can be taken from mine to mine, and thus be adapted for use with small veins, but it can be made stationary and of any desired size.

The invention is best described by aid of the accompanying drawing, in which,

Figure 1 shows a side view of my apparatus. Fig. 2 a section through the lines Y and Z of Fig. 1. Fig. 3 detail view of a part of the apparatus.

In these A is a revolving drum preferably of cast iron supported on two pair of rolls B B on each side of the ore chamber and two pairs of rolls X X, the latter being between the rolls B B, and bearing against the inner faces of the flanged ends of the drums as shown in Fig. 3. This part is shown more in detail in Fig. 3. The rollers X X are loose on the shaft, while rolls B are fast. Y Y are spacing pieces on shaft. The shafts C of these rolls are preferably supported on roller bearings D, and are held in place by a strap C' of metal as shown. The central part E of the circumference of this drum is occupied by a hard strong cast iron or steel shoe or anvil ring F carrying in its interior a roll V attached to it by cement or the like so that it can be renewed when worn. Revolving drum A is open in the center on both sides terminating there in hooked flanges G H. On one side as shown, the orifice is somewhat larger than on the other, and has a sloping annular lip I so as to deliver the crushed ore on to an ordinary launder not shown in the drawing. On each side of the central anvil ring are liners J of tough material sloping outward to the sides, so that as they are worn, they can be renewed. In a stout framework L

surrounding the drum and carried on the same bed plate K which carries the pulleys B on which the drum runs, I place the bearings of a shaft M, these bearings being eccentric with the axis of the drum, and nearest the point about 45 degrees from the vertical axis of the drum. On this shaft inside the drum I place a wheel N having a very strong cast iron or steel tire U held to the wheel by cement so that when worn it can be taken off and renewed. The tire is preferably of rectangular form and in any case coinciding in cross section at its periphery with the cross sectional form of the inside of the anvil ring, F. The framework L carrying the bearings of this shaft has the ordinary spring P and screw Q for taking up the wear common in roller mills. A chute S passing into the center of the drum on the opposite side to curb I delivers the quartz or ore. T, pipe for delivering water into the chamber A.

The mode of action is as follows:—A quantity of mercury when amalgamation is required is first placed in the drum. Water and quartz are passed into the drum on one side, as described, by the chute and pipe above mentioned. As the drum revolves, the quartz or ore is carried upward till it comes in contact with the annular roll N. Any material that slips to one side falls back and comes up again until it is crushed in fine particles. The gold and silver or other heavy ore gravitate to the bottom and are taken up by the mercury if present, while the constant run of water carries away the very fine crushed ore over the lip I and down on to the launder. As the tire of the main wheel gradually wears away from time to time, the bearings are screwed up to take up the wear. In the meantime the strength of the spring keeps the center roll pressed against the anvil ring F, yet will allow these to separate sufficiently if a hammer or any other very hard substance gets in between them. The axles of the wheels on which the drum is carried are shown revolving on roller bearings, but this is not absolutely necessary. The drum itself is driven by means of a belt around the anvil ring F which is made slightly curved in cross section for this purpose, and in some instances at each side of the carrying rolls B, I may arrange a curb to keep the whole in place, though this is not absolutely necessary. As the whole apparatus is fixed

on girders well braced together, it can be hoisted up and placed on a railway or other wagon, and carried quickly to its destination, and replaced in position without elaborate foundations.

On referring to the drawings it will be noticed that there is a separate lining W all around the trough at the point where there is the greatest wear; also that notwithstanding this lining the internal cross section of the trough is such as to cause all solid matters to sink rapidly to the bottom, and as the plane joining the axes of the roll and of the drum is at an angle with the horizon and therefore their junction is on one side of the centerline, while the feeding chute S is considerably to the other side of the centerline, all the solid matter fed in falls between the roll and the drum back of the point where the greatest crushing takes place, consequently as the mechanism revolves in the direction of the arrow shown in Fig. 1, no sooner do the lumps touch both the drum and the roll, than they begin to be crushed, the smaller pieces pass on till they begin to be crushed again, and so on until only the very finest particles pass the junction between the two parts. The finest particles mingle with the water as a fine mud, and are gradually carried away in suspension, thus leaving the space clear for the larger particles to be crushed without being wedged up by fine particles.

I claim as my invention:—

1. An apparatus for the wet crushing of ores consisting of a substantially cylindrical drum formed of an annular anvil ring and trough sides gradually widening toward the center and having a lip on one side for allowing the finely crushed slime to escape therefrom, means on the other side for admitting the materials to be treated an internal roll about four-fifths of the internal diameter of the drum and having an external face corresponding to the internal face of the annular anvil ring, an axle carrying said internal roll, an external frame on each side of the drum with adjustable spring bearings for the roll, and means for rotating the drum.

2. In an ore crushing machine, a drum formed of an outer anvil ring and trough like sides gradually increasing in width from the circumference to the center and having an annular opening with surrounding lip on one side and a central orifice on the other a little less in diameter than the said annular lip, means for admitting the

materials through the smaller orifice, an internal substantially parallel sided roll nearly the diameter of the outer anvil ring and fitting closely the sides where it abuts against the anvil ring, and means for rotating the drum.

3. In an ore crushing machine, the combination of a drum formed of an outer anvil ring and deep annular sides bulging outwardly and having central inlet and outlet openings formed therein, the walls of the outlet opening having an outwardly flaring flange or lip and an inwardly curved flange, a parallel sided revolving roll having an anvil ring rotating against the other anvil ring and means for forcing the roll against the drum with a strong pressure.

4. In an apparatus for crushing ores, a drum formed of a substantially cylindrical ring, an internal anvil ring formed of a separate piece but attached thereto, and sides each formed of a separate piece and attached to said ring, flaring outwardly toward the axial line, and having internal projecting annular lips around the central openings therein, one of said openings being greater in diameter than the other, and having an outwardly flaring slope or lip, and an internal roll having an anvil ring secured thereto and having its face with a cross sectional contour similar to the internal face of the anvil drum, with means for supporting the internal roll and means for driving the drum.

5. In an apparatus for crushing and concentrating ores, the combination of a revolving drum having a substantially cylindrical anvil ring and sides flaring outward toward the center and making an acute angle with the drum hereafter mentioned, an internal revolving roll nearly equal in diameter to the internal diameter of the drum and working against the anvil ring considerably on one side of the vertical center line of the drum, and substantially the same width as the anvil ring and the space between the sides where they join the anvil ring and a feeding device considerably on the other side of the vertical center line of the drum.

In witness whereof, I have hereunto signed my name this 13th day of December 1911, in the presence of two subscribing witnesses.

W. W. WRIGHT.

Witnesses:

WM. PIERCE,
H. WILLIAMS.