Sheet 1, 2 Sheets.

J. Hart.

Ore Amalgamator and Crusher.

No. 64,416. Patented May 7, 1867.

Fig. 2.

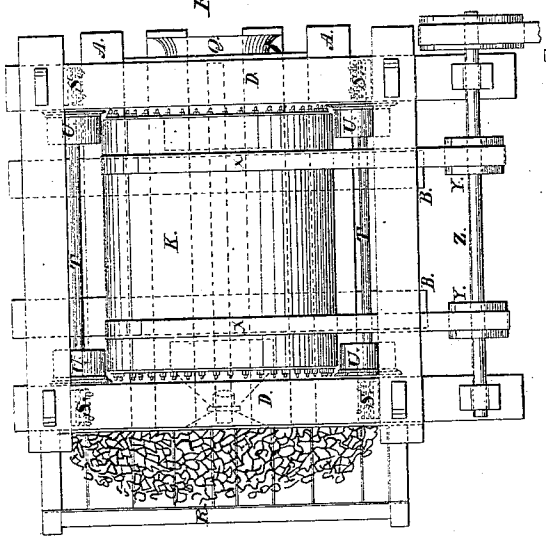


Fig. 3.

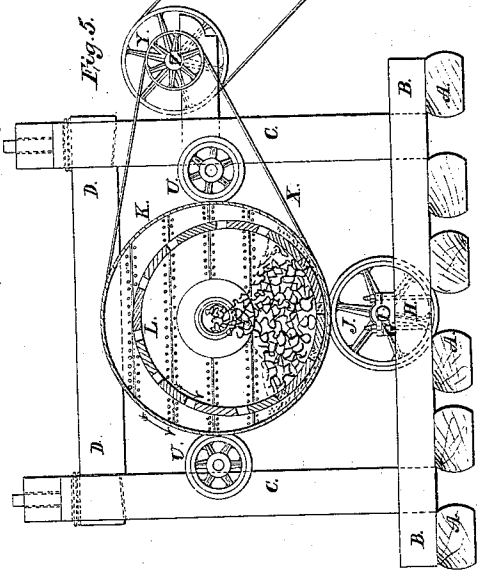


Fig. 1.

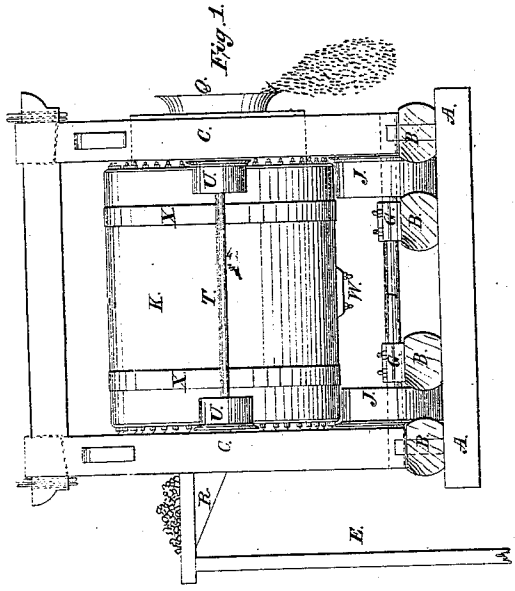
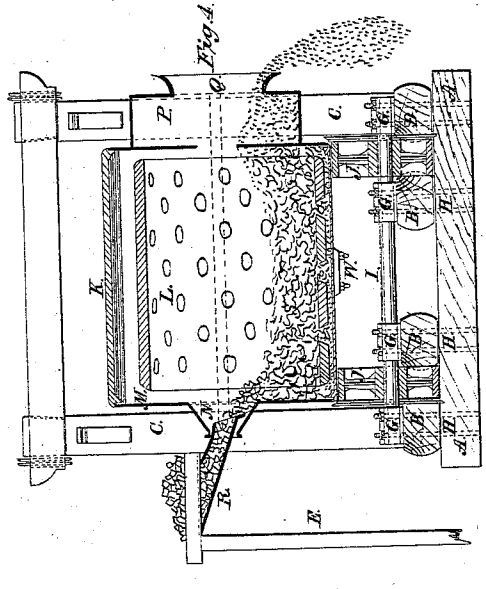


Fig. 4.



Witnesses:

William Robt. Baines

John Temple

Inventor:

James Hart

Sheet 2, 2 Sheets.

J. Hart.

Ore Amalgamator and Crusher.

No. 64,416. Patented May 7, 1867.

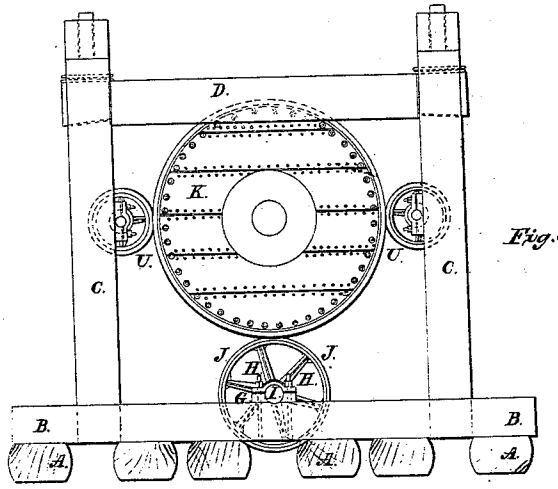


Fig. 3.

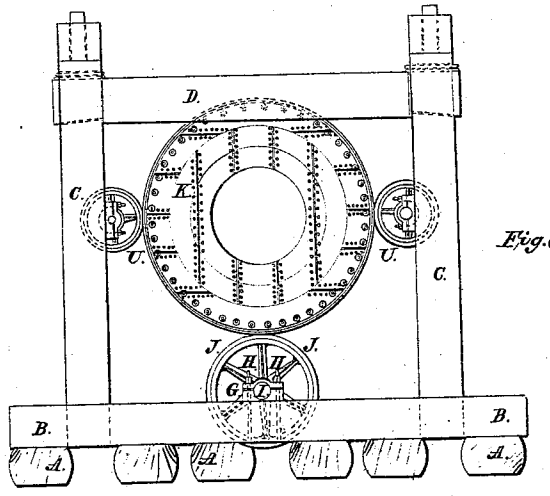


Fig. 6.

Attest:
Wilbur Robbins
John Temple

Inventor:
James Hart

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

United States Patent Office.

JAMES HART, OF MELBOURNE, VICTORIA.

Letters Patent No. 64,416, *dated May* 7, 1867.

IMPROVED APPARATUS FOR CRUSHING AND AMALGAMATING ORES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL TO WHOM IT MAY CONCERN:

Be it known that I, JAMES HART, of the city of Melbourne, in the colony of Victoria, engineer, have invented or discovered new and useful "improvements in Machinery Employed for Crushing, Amalgamating, and Washing Gold Quartz and other minerals or matters containing gold or other metal;" and I, the said JAMES HART, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:

This invention has for its object improvements in machinery employed in crushing, amalgamating, and washing gold quartz and other minerals or matters containing gold or other metal. For these purposes a cylinder is employed, supported in such manner that it may be caused to revolve freely; and this is most conveniently done by supporting such cylinder on wheels or rollers; but it may be otherwise supported. At one end of this cylinder is an opening, through which the end of a chute or trough enters, and by which the broken quartz, or mineral or matter, is conducted into the interior of the cylinder. The other end of the cylinder is formed with a central opening, through which the crushed and separated matters pass away into another cylinder of somewhat smaller diameter than the principal cylinder, to which it is fixed concentrically. The outer end of this smaller cylinder has an opening out of it somewhat larger than the opening above mentioned in the end of the principal cylinder. Within the large or principal cylinder is another heavy cylinder, which is open at both of its ends; and it is perforated with holes, in order that the broken and crushed materials may pass through such perforations. This inner cylinder is somewhat shorter than the interior of the larger or principal cylinder, so that, as the larger cylinder is caused to revolve, the interior cylinder is also caused to revolve; but, as the inner heavy cylinder is free, it at all times remains pressing on the part of the outer or principal cylinder, which, for the time, is at the lowest position; hence the material to be crushed will be pressed between the inner surface of the principal cylinder and the outer surface of the smaller heavy cylinder. Mercury, when used, is placed in the principal cylinder so as to come so far up towards the central outlet in the end of the principal cylinder that, when the refuse floats on the mercury, such refuse may fall out or pass out into the smaller cylinder; and this may be facilitated by a current of water; and should any heavy matter escape it will be returned back by the smaller cylinder fixed to the end of the larger cylinder. In some cases only water is used, and in other cases the machine is used without mercury or water.

Having thus stated the nature of my invention I will proceed more fully to describe the manner of performing the same.

Description of the Drawings.

Figure 1 shows a side elevation.

Figure 2 shows a plan.

Figure 3 shows an end view.

Figure 4 shows a longitudinal section.

Figure 5 shows a transverse section; and

Figure 6 shows the end elevation opposite that represented in fig. 3.

A and B represent the ground flooring, or standards and cross-logs, to which the framework of the machine is fixed. C C show the four posts of the framing, and D D the end or transverse timbers. T T are two iron shafts, supported in blocks S, fitted to the corner posts. U U are four rollers, fitted on the shafts T T, and which confine the outside cylinder K, which is composed of iron or steel. G G are four blocks or bearings, resting on the cross-bearers B, and they are secured to them by the bolts H. In these blocks or bearings the main shaft I works. J J are two wheels or rollers, attached to, and working on, the main shaft I, on which outer cylinder K rests. R is a chute or hopper, supported by two uprights E E, as shown, by which the materials are fed into the machine. M is one end of the outside cylinder K, and N is a short, conical mouth-piece, fixed on the end M, into which the end of the chute or hopper R is introduced, and by which the quartz or other materials to be operated upon are conducted into the machine. W is a tap-hole or opening in the cylinder K, through which it is cleaned out. X X are two belts round the outside cylinder K, driven by the pulleys Y Y on a shaft, Z, which is driven by a steam engine or other motive power. P is a short cylinder fixed to the other end of the outside cylinder K. Q, in the centre of the end of the cylinder P, is a conical lip. A quantity of

mercury having been placed inside the cylinder K, the quartz or other materials to be operated upon are conducted through the chute or hopper R, accompanied by a sufficient stream of water, into the cylinder K, motion having been imparted to that cylinder by means of the driving-belts X X, or, it might be, by other suitable gear. The quartz or other material to be operated upon so introduced into it, as above stated, coming between its interior surface and the exterior surface of the inside cylinder L, which rolls or revolves inside the outer cylinder, becomes finely crushed, and the particles, when sufficiently reduced, with the exception of the metallic substances therein, which become amalgamated with the mercury, and remain inside and at the lower part of the interior cylinder K, are carried out of the outer cylinder K, by the current of water, into a suitable receptacle, for further treatment, if desired. The heavier or metallic matters, if any, are carried over, remaining in the short cylinder P. When desired, the material to be operated upon can be crushed without the use of mercury or water.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that I do not confine myself to the precise details so long as its character be maintained; but what I claim, is—

The combined arrangement of the cylinders L M P, constructed and working substantially as herein described.

JAMES HART.

Witnesses:

CHAS. CHICHESTER BENCRAFT, *Solicitor and Notary Public, Melbourne.*

ROBT. HADEN SMITH, *Solicitor, Melbourne.*