(No Model.) 2 Sheets—Sheet 1.

G. W. STRONG.

AMALGAMATOR AND SETTLER.

No. 522,807. Patented July 10, 1894.

Fig. 1.

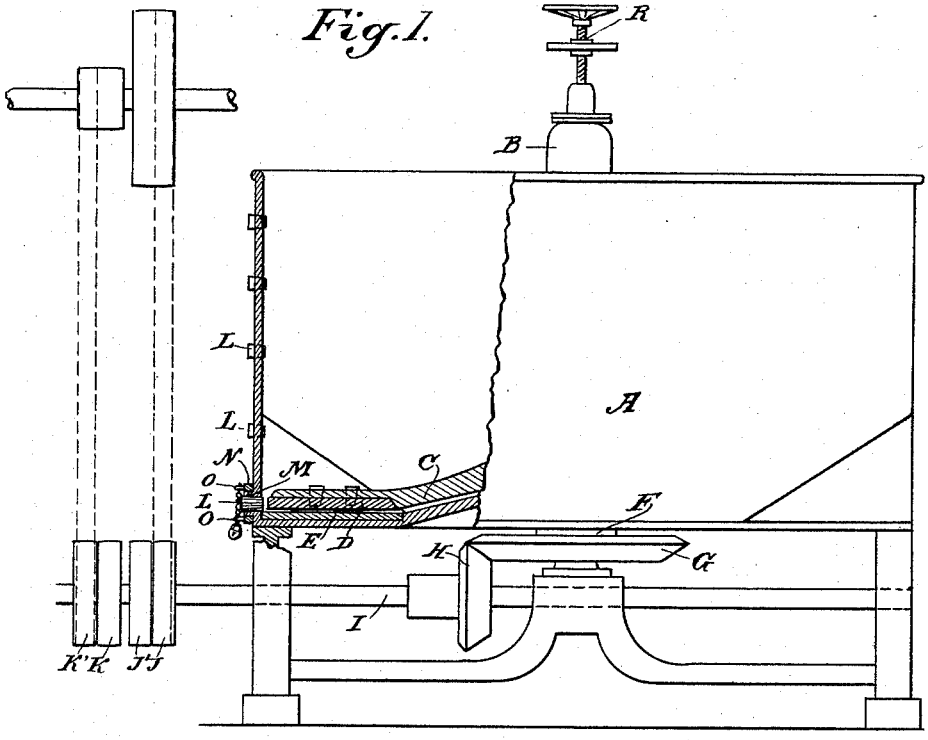


Fig. 2.

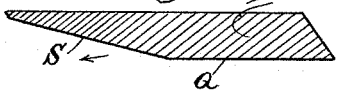
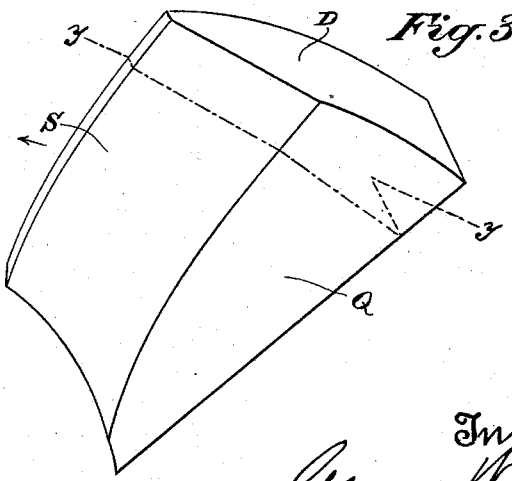


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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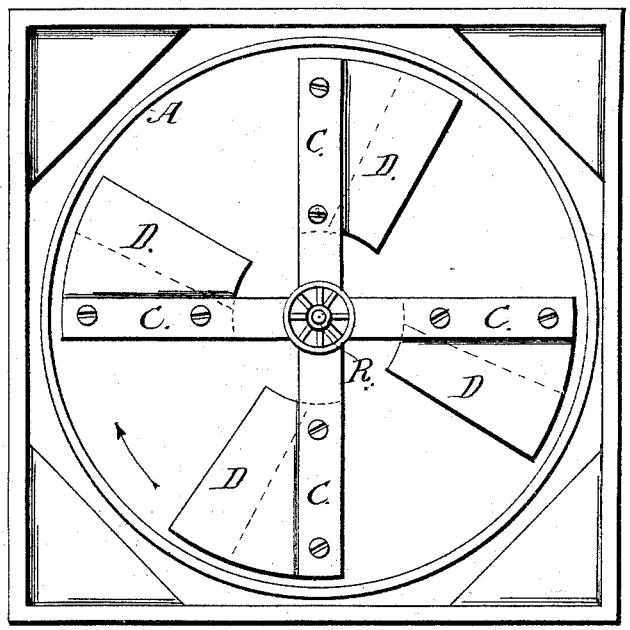
Fig. 4.



WITNESSES
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UNITED STATES PATENT OFFICE.

GEORGE W. STRONG, OF SAN FRANCISCO, CALIFORNIA.

AMALGAMATOR AND SETTLER.

SPECIFICATION forming part of Letters Patent No. 522,807, dated July 10, 1894.

Application filed August 29, 1893. Serial No. 484,313. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. STRONG, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Amalgamators and Settlers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a combined amalgamator and settler for ores of precious metals.

It consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of my apparatus. Fig. 2 is a cross section of the shoe on line *y—y* of Fig. 3. Fig. 3 is a bottom view of one of my shoes. Fig. 4 is a plan view of the apparatus.

The object of my invention is to combine in a single apparatus means for first grinding and amalgamating the ore pulp; and, secondly, means for afterward settling and separating the valuable precious metals from the lighter worthless material in the pulp without removing the latter from the pan in which the grinding has been done. Lastly, in a means for insuring the safety of the valuable products within the pan.

In carrying out my invention I employ a pan A of any suitable or desired form, having a central cone B, and what is termed a muller or carrier C, to which the grinding shoes D are attached. The bottom of the pan is provided with removable dies E, so that both shoes and dies may be replaced whenever too much worn for further duty.

The muller carrying the grinding shoes is driven in the usual manner by a vertical shaft F extending down through the cone having a bevel gear G upon its lower end which is engaged by a pinion H upon the horizontal shaft I. Upon this shaft two sets of pulleys J J′ and K K′ are fixed. The pulley J is driven by a belt from a pulley upon a countershaft sufficiently larger than the pulley J so that a speed will be imparted to the connected parts sufficiently to drive the grinding shoes as fast as may be desired, for effectively grinding the material and amalgamating the metal. The other pulley K is driven at a slower rate of speed by a correspondingly less sized pulley upon the countershaft.

The pulleys J′ and K′ are the loose pulleys upon which the driving belts are moved when the pan is to be stopped, and one of these belts remains upon its idler or loose pulley, while the other is driving the grinding mechanism.

By this construction I am enabled to impart two different rates of speed to the rotating mechanism within the pan. The first being a speed sufficiently great to properly grind the material, and when this is finished the grinding shoes and muller are raised out of contact with the dies in the bottom of the pan by a screw R and a slower rate of speed is imparted through the second pulley K when the apparatus acts as a settler and separator, the muller then acting as a slow moving stirrer by which the particles of metal and heavier valuable material will be separated from the lighter pulp, and will gradually settle to the bottom of the pan. This bottom is higher in the center than at the periphery and may have, if desired, a settling chamber or channel lower than any other part, into which the valuable portions eventually settle.

L L are plugs serving to stop openings in the side of the pan at different heights, so that the material may be drawn off, first from the surface and then lower down, the last plug connecting with that portion of the pan which contains the valuable precious metals and sulphurets. This lowest plug fits into a hole which has a surrounding projecting boss M. Around this boss is shrunk or otherwise secured a ring N having eyes or attachments O upon opposite sides. To one of these attachments is fixed one end of a chain, strap, or flexible fastening, and the opposite end of this fastening is attached and locked to the other eye, thus passing over the plug when the latter is in place and preventing its removal. This prevents any tampering with the contents of the pan except by the party who has the key and can open the lock.

The shoes which I employ in my apparatus are formed, as shown at Q, having a grinding face on the under part of the shoe made shorter than the top of the shoe in the direction of its motion. This is effected by making the incline or bevels of the front part of

the shoe, at greater or more acute angle than that of the rear. By this construction, the pulp is always forced beneath the shoes, instead of being pushed along in front, and is carried more rapidly between the shoes and the dies. This insures the most rapid grinding and a more regular wear of the grinding surface.

As the shoes are worn away, the grinding surface becomes more extended, but the incline in front always remains the same, and the pulp is continually forced beneath the shoes.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for working ores of precious metals consisting of a pan, a muller or carrier, and mechanism by which the muller is rotated within the pan, shoes and dies between which the ore bearing material is ground, and means for raising the muller and shoes above the surface of the dies so that it will rotate out of contact therewith, a horizontal driving shaft through which power is applied to rotate the muller, and driving pulleys of different diameters fixed upon said shaft with corresponding loose pulleys and belts extending from countershaft pulleys to said driving pulleys whereby different rates of speed are given to the muller for grinding and for settling purposes, substantially as herein described.

2. In an apparatus for working ores, the combination, of a single pan having a muller rotatable therein, shoes and dies between which the ore bearing material is ground, mechanism through which different rates of speed may be imparted to the muller, and means for elevating the muller and shoes above the surface of the dies whereby the material may first be ground and amalgamated and afterward the muller elevated to permit the settling and separation of the material within the same pan in which it is ground.

3. In an amalgamator, the combination, of a single pan having openings in its side, a muller rotatable in said pan, shoes and dies between which the material is ground, means for elevating the muller and shoes above the surface of the dies, means for rotating the muller at a slower speed when thus elevated than when in its lowered position, whereby the ground and amalgamated material is permitted to settle and separate in the same pan in which it is ground, plugs or stoppers for the pan openings, a flexible band or chain passing over the same, and a lock for securing the band or chain.

In witness whereof I have hereunto set my hand.

GEORGE W. STRONG.

Witnesses:
S. H. NOURSE,
J. A. BAYLESS.