(No Model.)

G. H. MALTER.

AMALGAMATING PAN.

No. 299,409. Patented May 27, 1884.

FIG. 1.

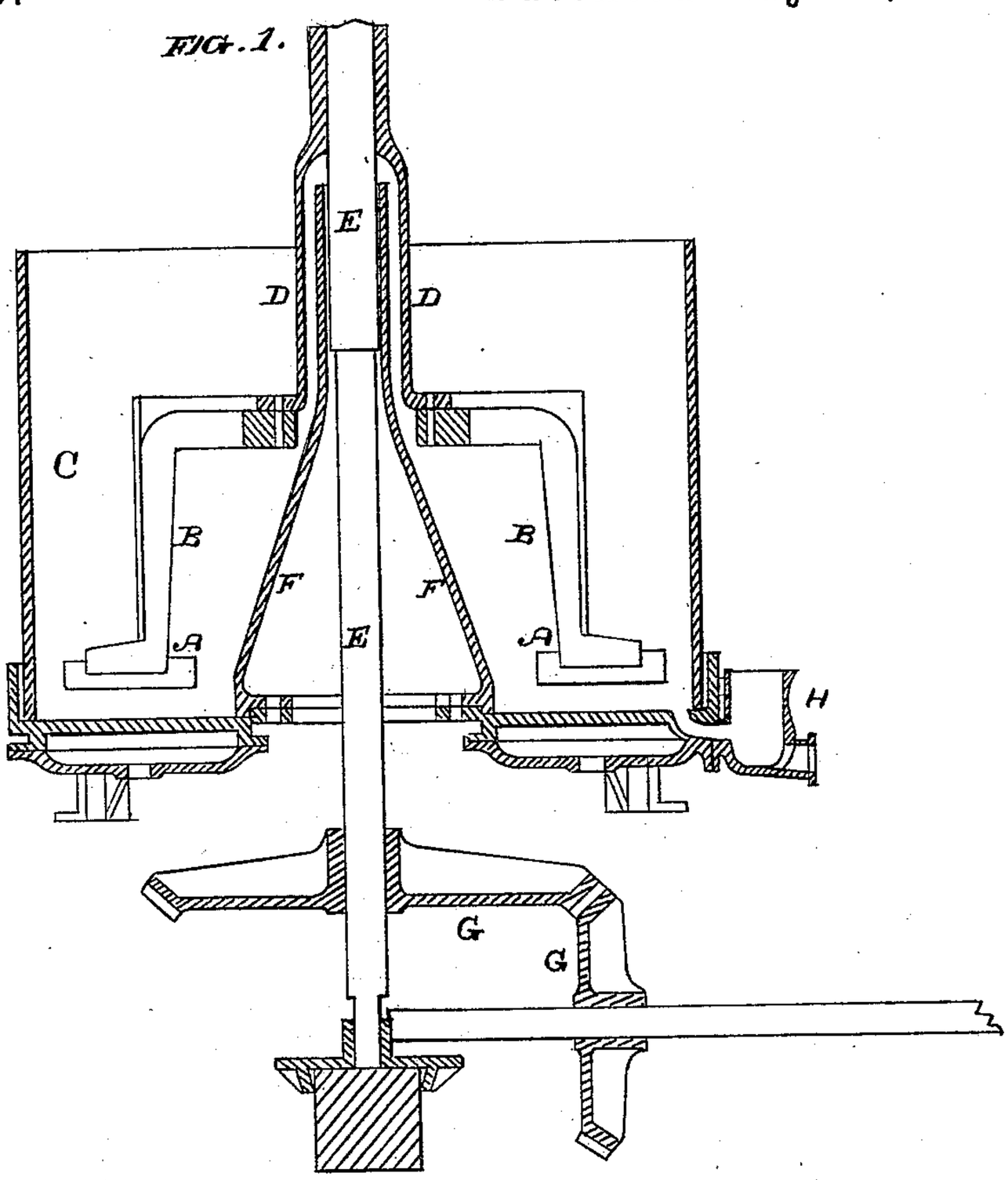
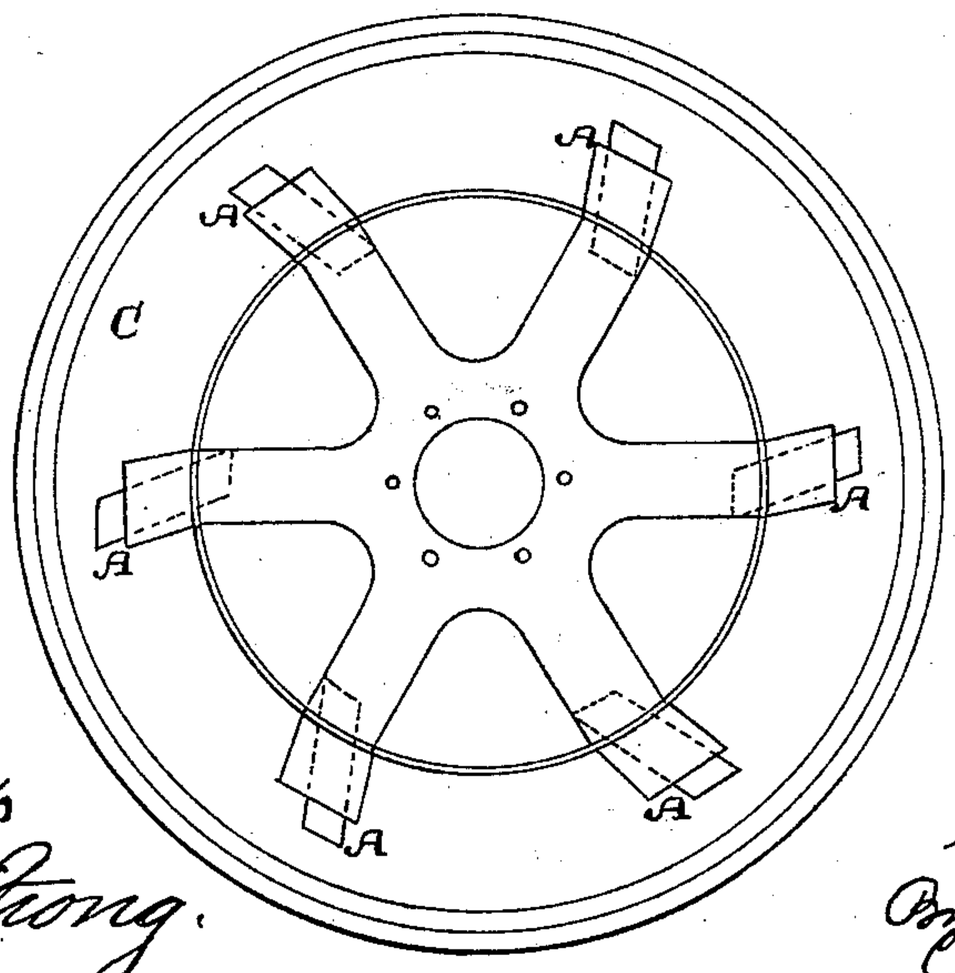


FIG. 2.



Witnesses,
Geo. H. Strong.
J. A. Strouse.

Inventor,
Geo. H. Malter
By Dewey & Co.
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE H. MALTER, OF SAN FRANCISCO, CALIFORNIA.

AMALGAMATING-PAN.

SPECIFICATION forming part of Letters Patent No. 299,409, dated May 27, 1884.

Application filed September 18, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. MALTER, of the city and county of San Francisco and State of California, have invented an Improvement in Amalgamating-Pans; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in apparatus for amalgamating or recovering gold or silver from their ores; and it consists of a pan the bottom of which forms a receptacle for the mercury, which remains in one compact body during the process of amalgamation, and over which rests the ore pulp to be amalgamated, being made to move by a series of radial arms having feet or wipers, and being surrounded by a cylinder or band and connected with a central vertical shaft from which it receives its motion, thus causing the amalgamation of the metal in the ore pulp within the pan, as will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section taken through the center of the pan. Fig. 2 is a plan or top view.

In the ordinary construction of amalgamating-pans it is customary to scatter the mercury through the pulp by means of rings or mullers, with shoes of various kinds, between which and dies upon the bottom of the pan the pulp is caused to pass, mercury being placed in the pan to amalgamate any gold which may be found in the pulp. The use of these shoes and dies or any rubbing or grinding surfaces is objectionable, because they flour the mercury or separate it into small particles, which are distributed through the pulp, and it is very difficult to again concentrate the mercury into a mass, or to recover it from the pulp with which it becomes mixed. It is also much less effective in saving the gold or silver than when kept in one body or mass, as is done in my apparatus, in which it is exposed to the eye all the time during the process, and can be treated with chemicals and kept in the most favorable condition to absorb the metal to be amalgamated. In my apparatus there are no mullers or dies; but the inside of the bottom of the pan is smooth, so that the quicksilver can spread over it and remain in one compact mass during the process of amalgamation, and is exposed to the eye in a quicksilver-bowl placed outside of the pan, communicating by means of a narrow channel or pipe with the inside of the pan.

I employ wooden or smooth metallic stirrers A, which are fixed to the lower ends or feet of the arms B, so as to just wipe over the surface of the mercury in the pan C and keep a constant bright surface, into contact with which the pulp is continuously brought, so that particles of precious metals may be detained therein. The arms B are vertical, and may be four, six, or more in number. They stand vertically nearly midway between the center and circumference, and at the top bend inward so as to join a sleeve, D, at the center. This sleeve has a hub at the top, which is keyed to the vertical shaft E, passing down through a hollow cone, F, in the center of the pan, and is driven by a bevel-gear, G, below, in the usual manner. Around the outside of the vertical portions of the arms B is fitted a cylindrical band or sleeve of considerable width, extending from the feet upon which it rests to or above the tops of the arms. This band may be made of iron, or of copper and iron combined, or any other suitable metal to which mercury may be applied, this cylinder being designed not only to regulate the currents of the pulp, as hereinafter described, but also to collect the amalgam, which will readily adhere to it as it revolves with the pulp. The cylinder can also be easily removed and the amalgam collected by it be scraped off. This band, from its depth, will prevent the pulp from flowing outward rapidly or directly by centrifugal action; but it will cause it all to flow beneath its lower edge, so as to come into intimate contact with the mercurial surface, which is kept bright by the wipers A. Passing up on the outside, it rolls inward into contact with the outside of the amalgamated surface of the band, and at the top flows over its upper edge toward the center and down along the inside, being thus exposed to constant and repeated contact with a very considerable body of mercury, bright and clean, and the vertical amalgamated sides of the ring, while the mercury is not subdivided or broken up, and thus lost.

An important advantage of the amalgamated band traveling in the pulp and in the same direction is that the amalgam and valuable metal will readily adhere to the surface, and will not be rubbed off by friction, as would occur if the band or plate were stationary and the pulp formed a current over its surface.

Upon the outside of the pan is a siphon or cup, H, which is connected with the lower part or mercury-chamber of the pan by a passage through which the mercury may flow, and its quality or condition examined from time to time during the process of amalgamation. A discharge-pipe leads out from this cup, so that the mercury or amalgam may be drawn off at any time at will. The central cone is narrow at the top, and its diameter gradually increases toward the bottom, the shape assisting to direct the pulp beneath the band and keep up the circulation.

I am aware of the patents to A. B. Paul, No. 193,030, July 10, 1877, and W. H. Howland, No. 244,240, July 12, 1881, the former of which shows a pan having the outer and inner portion of its bottom at different levels and a muller operated in both parts, and also having an annular rim supported upon the muller and reaching to near its bottom of the outer compartment, so as to allow partial separation of the contents of the two compartments, and a gradual discharge from the inner to the outer one, and the latter shows a rotating yoke carrying arms and plates revolving in a pan provided with dies and a ring.

I am also aware of the patents to H. Bourne, No. 3,267, September 14, 1843; A. B. Crosby, No. 4,964, July 9, 1872; W. E. Harris, No. 259,011, June 6, 1882; E. Hinckley, No. 149,127, March 31, 1874, and I. W. Knox, No. 27,990, April 24, 1860; and I do not desire to claim, broadly, any of the features therein shown.

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

In an amalgamating-pan, a series of radial arms extending outward from a central driving-shaft, E, and carrying shoes upon their lower ends to dip into a body of mercury in a receptacle formed by the bottom of the pan, in combination with a band or ring surrounding the arms and traveling in the same direction with the pulp, and forming a cylindrical diaphragm extending upward from near the surface of the mercury, and an interior cone, F, made diverging toward the bottom, all substantially as shown and described, and for the purpose set forth.

In witness whereof I have hereunto set my hand.

GEORGE H. MALTER.

Witnesses:
S. H. NOURSE,
H. C. LEE.