

6. In a concentrating machine of the class set forth, the combination and arrangement with a table or dish, such as A, having a peripheral feed, a discharge-pipe, such as D, and a discharge opening, such as E, of a valve-seating as E¹, and a valve-piece, such as E², on said discharge pipe, such as D, and devices by which such valve-piece, such as E², is regularly intermittently lifted off and on its seat, such as E¹, substantially as herein described and explained, and as illustrated in the drawing.

7. In a concentrating machine of the class set forth, the combination and arrangement with a discharge-pipe, such as D, discharge-opening, such as E, valve-seating, such as E¹, and valve, such as E², of a lever, such as E³, connecting-link, such as E⁴, with ball-and-socket connections at its either end, and bell-crank, such as E⁵, to which reciprocating motion is imparted, substantially as herein described and explained, and as illustrated in the drawing.

8. The particular combination and arrangement of mechanical parts altogether forming a concentrating machine, an amalgamating and concentrating machine or an amalgamation machine, substantially as herein described and explained, and as illustrated in the drawing.

Dated this 27th day of August, 1894.

WILLIAM TARRANT.

IMPROVEMENTS IN, AND CONNECTED WITH, THE RECOVERY OF METALS FROM THEIR ORES.

We, Charles Edgar Chapman, of Adelaide, in the Province of South Australia, agent, and Thomas Fenton Whitford, of the same place, mining engineer, do hereby declare the nature of our invention for "Improvements in, and Connected with, the Recovery of Metals from their Ores," and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention is devised to secure a horizontally oscillating motion resembling, as near as possible, that of a pan worked by a man settling gold while panning-off, and also to cause the material to be operated upon to be distributed and passed over a series of specially-designed amalgamating or concentrating tables or slides in a thin, or even film or layer, so that all the metal to be saved is brought gradually in contact with the mercury or blanket. This desired motion is secured, first by the arrangement of a series of sieves and slides or sliding tables in a chest, in the manner hereinafter described; and secondly, by mounting the chest containing the said sieves and slides upon a frame working upon a king-pin and friction-rollers, and actuating it to and fro by a reciprocating arm or rod, as hereinafter described.

We may use in the chests either all amalgamated or all concentrating slides or some amalgamating or some concentrating slides, according to the quality of the ore and the nature of the country.

Another important feature of our invention is the arrangement in connection with the foregoing amalgamating slides of a set of zinc plates and blankets underneath the copper plates, whereby an electric current is set up which keeps the mercury or amalgam on the copper plates in an active and pure condition. We have discovered, after careful experiments, that the combination of these parts and devices enables ore or material containing gold or other metal, after being reduced to a suitable condition by stamping or rolling, to be acted upon very completely by the mercury upon the amalgamating slides, or by the blankets upon the concentrating slides. The electric current above-mentioned, of course, only applies in the case of amalgamating on other parts of our invention, apply both to amalgamation and concentration, and when the amalgamating-slides are used alone the operation may be conducted either dry or wet, according to the material to be treated and the surrounding conditions.

In the drawings, Fig. 1 represents a side elevation of our apparatus; Fig. 2 is a plan; Fig. 3 is a back view; and Fig. 4 is a vertical section on line A-B of Fig. 2. A is a chest constructed either of wood or iron, the front and back being hinged to form doors, which can be locked for safety and opened to allow of the removal and changing of the amalgamating and concentrating slides. The chest A is securely attached to three beams C, C, C, which extend forward, and are joined together by floor C¹, which is used as a concentrating table. These beams C, C, C are also attached to heavy cross-beam C² and with the floor form an under-frame. Beneath the beam C² is a bed-log D firmly fixed in the ground, and at the rear of the under-frame is a second bed-log E. A king-bolt or pin R passes through the beam C² and through a short block beneath it into the bed-log D, and the under-frame is supported by four friction-wheels F¹, F², F³, F⁴, two on each of the bed-logs, while at the rear of the under-frame is a bracket C³, to which a reciprocating-rod G is pivotted, the said rod connecting with any convenient motive-power.

Above the chest is a hopper A¹, and within the chest are amalgamating slides H¹, H², H³ and concentrating slides K¹, K², K³. Above the receiving end of each of the amalgamating and concentrating slides is a sieve J, which breaks up the water and other material, and causes it to fall in a shower instead of in a stream. These sieves are supported upon runners or brackets, so that they may be readily removed when desired.

Each of the amalgamating slides and concentrating slides is made so that it may be slid in and out of the chest, and is supported (except the bottom one), so that its inclination may be made greater or less as required.

We rest the slide directly upon a bar or ledge at either side, hinged at the delivery-end of the slide to the side of the chest upon a pin L¹; the free end of the bar or ledge rests upon a thumb-screw L², which is supported in a tapped bracket L³, secured to the side of the chest. The slide is prevented from sliding off the bar or ledge at the lower end by a stop L⁴, fixed to the side of the chest.

We construct the amalgamating slides upon wood or metal frames, the surface being formed of copper-silvered plates. Between the copper plates and frames we place a number of strips or pieces of zinc plate, the spaces between the pieces of zinc plates being filled with baize, blanket, or canvas.