

H. LUCKENBACH.
 AMALGAMATOR.
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1,052,157.

Patented Feb. 4, 1913.

Fig. 1.

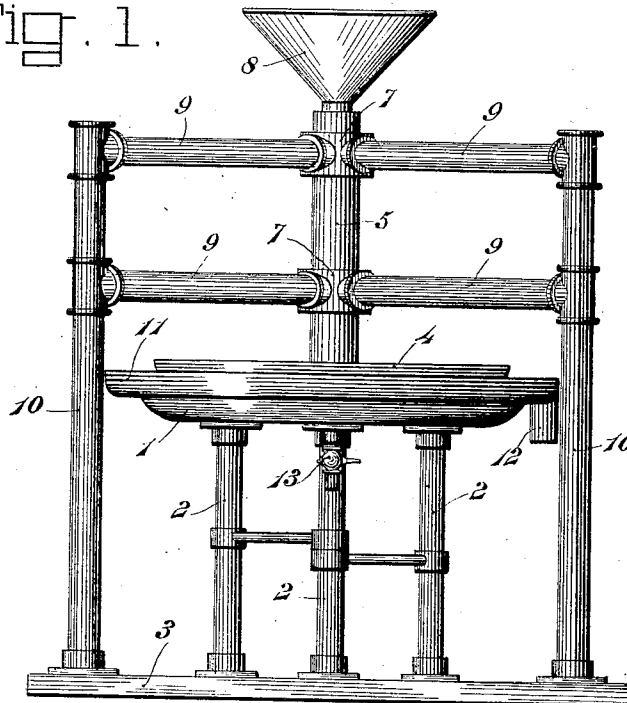
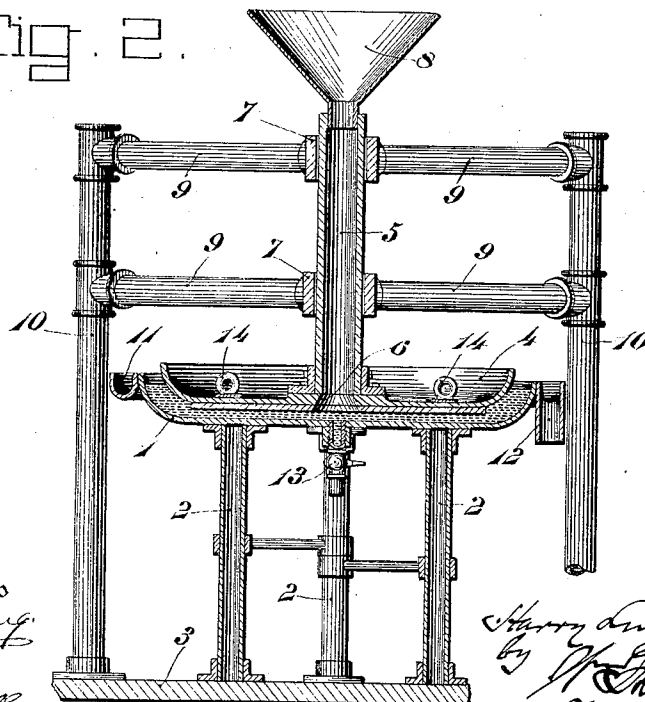


Fig. 2.



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AMALGAMATOR.

1,052,157.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HARRY LUCKENBACH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Amalgamators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in amalgamators and it proposes an apparatus which is especially applicable to the recovery of gold or precious metals, and in which the auriferous water or pulp from the pulverizing mill or placer sluice box is caused to come into intimate contact with an unbroken body of mercury which takes up the fine particles of metal continuously with the passage of the water or pulp. According to the present invention two pans are employed, one of which fits conformably within the other. The lower and larger pan contains an adequate quantity of mercury and the upper pan floats on this body of mercury and is equipped with a centrally arranged stand pipe of considerable height and weight through which the auriferous water or pulp is conducted to the space between the pans. As this water or pulp issues from said pipe it is caused to spread out in a very thin sheet over the surface of the mercury so that all the suspended particles of gold or precious metal come into intimate contact with the mercury. The latter in fact, under the pressure of the upper pan has a sort of abrasive action on the water or pulp and efficiently serves its purpose of spreading out the material without any destructive agitation of the mercury.

An embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of the improved amalgamator; Fig. 2 is a vertical sectional view thereof.

Similar characters of reference designate corresponding parts throughout the several views.

The mercury is contained in a relatively

shallow pan 1 which preferably has the form of a saucer and is supported upon legs 2 which are in turn fixed to a bed plate 3. Immediately above the pan 1, a mating part 4 is disposed. The body 4 floats on the mercury and may be conveniently made in the form of a saucer like pan of less diameter than the pan 1 but fitting conformably in the same. The pan 4 is provided at the lower end of a stand pipe 5 which is of relatively considerable weight and has such height that the flowing column of water or pulp which it incloses is amply sufficient to overbalance the mercury in the pan 1. For example, assuming that the mercury in the pan 1 has an approximate depth of two inches, the pipe 5 will have a height of forty inches, such height not only providing for the weight necessary to secure an efficient abrading and amalgamating action but also providing for such a head of water or pulp as will effectively displace the mercury in the pan 1 and thereby insure a free and relatively rapid movement of the column of water or pulp through the pipe 5 and across the face of the mercury contained in the pan 1. Otherwise stated, assuming that 13 inches of water in column will just overcome 1 inch column of mercury, and that the lower pan contains two inches in depth of mercury, I make the stand pipe substantially 40 inches in height and in such proportions that the weight of the column will be in the proportion of substantially 20 inches to each 1 inch of mercury in the pan, thus providing for all pulp and water in the stand pipe to pass freely between the bottom of the top pan and the body of mercury and in direct contact with the surface of the mercury. In this connection it may be noted that the pipe 5 communicates with a central opening 6 in the pan 4 through which the auriferous water or pulp is delivered to the space between the pans.

The pipe 5 passes through guide sleeves 7 which accurately center and guide said pipe and the pan 4 and at the same time allow of a vertical movement of the pipe in accordance with the floating action of the pan 4. A hopper is provided at the upper end of the pipe 5 through which the auriferous water or pulp from the pulverizing mill or the placer sluice box passes to the pipe 5. If desired soda or an equivalent agent may be introduced into the hopper 8 for the purpose

of scouring the valuable particles and thus freeing them from such foreign matter as might resist or prevent the amalgamating action. The guide sleeves 7 are arranged centrally of cross arms 9 which are secured at their ends to uprights 10 that are mounted upon the bed plate 3. By preference the legs 2, arms 9, and uprights 10 are of tubular form this construction furnishing the requisite supporting strength and being also of economical nature.

The pan 1 is equipped with a circumscribing trough or gutter 11 into which the water or pulp overflows from the pan 1 and which has at any desired point an outlet connection 12. The pan 1 is also provided with a drainage cock 13 through which the amalgam may be drawn off prior to the introduction of a fresh supply of mercury. The pan 4 has on its upper face two or more eyes or loops 14 which are provided to receive lifting hooks that are employed to raise the pan 4 away from the pan 1 when access is desired for cleaning or other purposes.

In use the mercury is placed in the pan 1 to about two thirds of its capacity and the pan 4 rests on the mercury, bearing thereupon with considerable pressure by reason of its weight and of the added weight of the relatively long pipe 5. Auriferous water or pulp is then passed through the hopper 8 and the pipe 5, forming a column in the latter which has such extent or head by reason of the relative height of the column together with the weight of the pipe and pan, as to overbalance the mercury in the pan 1. The water or pulp thus passes through the opening 6 and over the surface of the mercury being in its passage thereover spread out in a thin sheet by reason of the pressure existing between the pan 4 and the body of mercury so that its valuable particles are brought into intimate contact with the mercury and are thoroughly amalgamated. The overflow passes to the gutter or trough 11 from which it discharges through the outlet connection 12.

The operations stated are accomplished without the aid of any mechanical power and without the incident of any agitating and consequent destructive disintegration of the mercury which is carefully guarded against so that the loss which commonly

arises from this cause is avoided. The parts are so arranged and proportioned that the necessary power for operation is furnished altogether by the head of water or pulp in the pipe 5 and the power thus furnished is utilized in the most efficient manner, with regard both to the quantum and the time of recovery. Aside from the advantages incident to the operation, the improved amalgamator has the further advantages of being light, compact, self contained, and readily portable. By employing a stand pipe having a height and capacity for a body of pulp sufficient to displace mercury in the pan, and providing means for positively guiding the upper pan or mating part a modifying influence of one feature on the other is obtained so that swaying of the mating part, the mercury, and the pulp is prevented and the head of pulp will flow evenly and uniformly between the mercury and upper mating part without surging or agitation of the mercury and pulp, and thus a more thorough and efficient amalgamation and collection of the metal is obtained.

Having fully described my invention, I claim:—

An amalgamator of the character described, embodying a fixed mercury containing pan, a non-rotating mating part fitting within the pan to float on the mercury contained therein, and having its under face, in contact with the mercury, formed to avoid agitating the mercury, a stand-pipe disposed centrally in relation to the mating part and having a height and diameter substantially as described to contain a body of pulp sufficient to over-balance the mercury in the pan, said pan and stand-pipe being of sufficient weight to materially displace mercury in the lower pan, and means for positively centering the pipe and allowing rising and falling movements thereof and of the pan in accordance with the floating action of the mating part and to avoid agitation of the mercury and pulp, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY LUCKENBACH.

Witnesses:

HARRY SIMONS,
WARREN A. CAHN.