S. F. CHARLES.

Amalgamator.

No. 202,703. Patented April 23, 1878.

Fig. 1

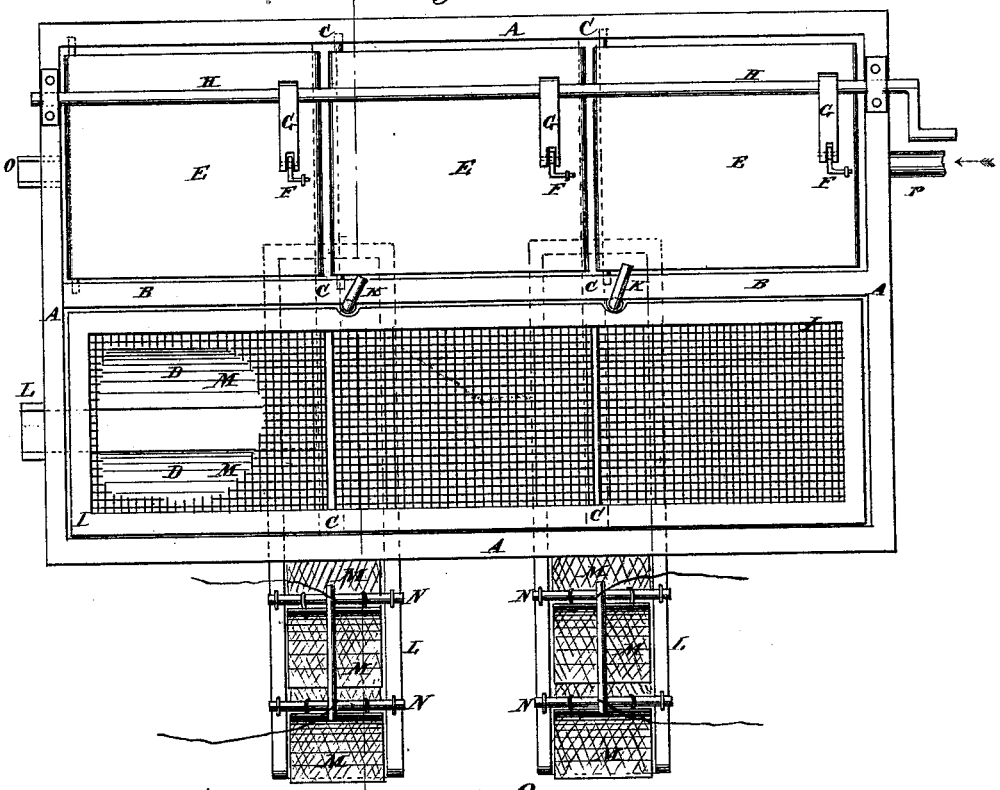
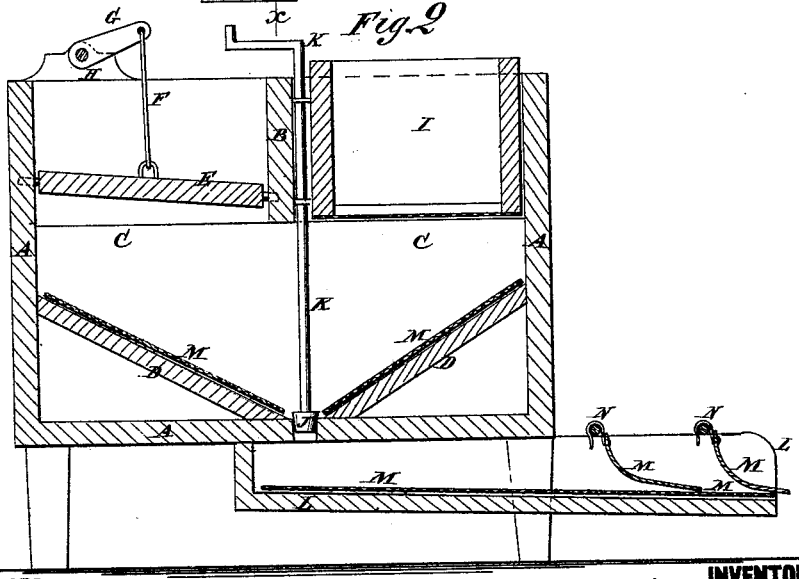


Fig. 2



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S. FREDRIC CHARLES, OF CUMMING, GEORGIA.

IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. **202,703**, dated April 23, 1878; application filed November 17, 1877.

To all whom it may concern:

Be it known that I, S. FREDRIC CHARLES, of Cumming, in the county of Forsyth and State of Georgia, have invented a new and useful Improvement in Apparatus for Separating and Preserving Fine Gold and Silver, of which the following is a specification:

Figure 1 is a top view of my improved apparatus. Fig. 2 is a detail cross-section of the same, taken through the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved apparatus for separating fine gold and silver from the sand or crushed rock and preserving it, which shall be simple in construction and more effective in use than the ordinary apparatus.

The invention will first be described in connection with the drawing, and then pointed out in the claims.

A is a large tank, the upper part of which is divided longitudinally into two compartments by a partition, B, and its lower part is divided transversely into three or more compartments by partitions C. The cross-compartments are made V-shaped by inclined bottom boards D.

In one of the longitudinal compartments, to the lower part of the partition B and to the side of the tank A, are pivoted as many plungers E as there are cross-compartments in the lower part of said tank.

The plungers E are pivoted at one end, and to their other ends are pivoted the lower ends of the connecting-rods F, the upper ends of which are pivoted to cranks G, formed upon or attached to the shaft H. The cranks G are designed to be so formed that the shaft H may be revolved.

The shaft H revolves or rocks in bearings attached to the tank A, or to other suitable supports, and is designed to be driven from the driving mechanism of the stamp-mill. In the other longitudinal compartment of the tank A is placed a sieve, I, which rests upon the upper edges of the cross-partitions C, and the wire-cloth of which is designed to be graduated, being finer toward the head and coarser toward the tail of the said tank A.

In the lowest part of each cross-compartment is formed a discharge-hole, which is closed with a plug or valve, J, the stem K of which projects up into such a position that it may be conveniently reached and operated by an attendant, to open and close the said discharge-openings.

From the discharge-openings of each of the cross-compartments a trough, L, leads out at the side or end of the tank A, which conducts the pulp to a receiver, from which the lighter material is allowed to flow off. The inclined bottom boards D of the cross-compartments and the bottom of the troughs L are lined with an amalgamated cloth, M. Strips of the amalgamated cloth M are also suspended in the troughs L from rods N, attached to the upper edges of the said troughs L, or by other suitable means. The amalgamated cloth M is made more effective by connecting it with the poles of a battery by conducting-wires.

The tank A is provided with an overflow-spout, O, and with a pipe, P, to admit clean water. Clean water may also be admitted into the troughs L through a pipe, which is not shown in the drawings.

The amalgam for the cloth M is formed by mixing fine precipitated pure silver and mercury with a solution of gutta-percha. This mixture is thoroughly worked into and through the tissues of the cloth, and the cloth thus prepared is subjected to a strong pressure between moderately-heated polished iron rollers, by which the cloth is fully impregnated with the mixture. The solvent soon volatilizes, leaving the gutta-percha and the metals in their natural state combined with the cloth. The cloth thus prepared is impervious to water and very durable, and the metal contained in it cannot be washed out by water or removed by friction; but there will always remain enough metal at the surface to readily take up mercury when rubbed upon it.

With this construction, as the outflowing pulp comes in contact with the amalgamated cloth, the fine gold will adhere to the cloth, being compelled to flow or run between two surfaces of mercury, which takes up all the fine or floating gold or silver not usually saved by other apparatus, forming a gold-amalgam which may be scraped off with india-rubber.

The gold or silver can thus be taken up at pleasure. Enough gold will always remain

in the cloth to pay for the same quantity of new cloth when it becomes useless by accident or long-continued use. If the cloth should become too dry from long use, or from taking off gold-amalgam, fresh mercury can be put on with thick flannel cloth, in rain form, and rubbed on with india-rubber.

My amalgam-cloth is made as follows: I use canvas or sail-cloth to hold the mercury. The gutta-percha is dissolved in bisulphide of carbon, a fine precipitate of silver and mercury being added, agitated, and thoroughly mixed. The mixture is then applied with a brush on the cloth, which is afterward passed between moderately-heated and polished rolls under pressure. By this the bisulphide of carbon is volatilized and the gutta-percha left in the fibers of the cloth, the fine metal being incorporated with the cloth, so as to make a solid mass of silver-amalgam, which cannot be removed except by fire or strong acids, and is very durable. The mercury can be applied at any time, and the gold may be taken off, when a sufficient accumulation has taken place, by the use of rubber.

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

1. The combination, with the ore-separator bottom, of the cloth M, charged with electricity, as described.

2. The combination, with the tank A B C, having inclined and valved bottoms, of the plungers E, the sieve I, the amalgamated cloth M, and the trough L, as set forth.

3. As a new article of manufacture, an amalgam-cloth having silver-amalgam and gutta-percha in its interstices, as set forth.

S. FREDRIC CHARLES.

Witnesses:

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