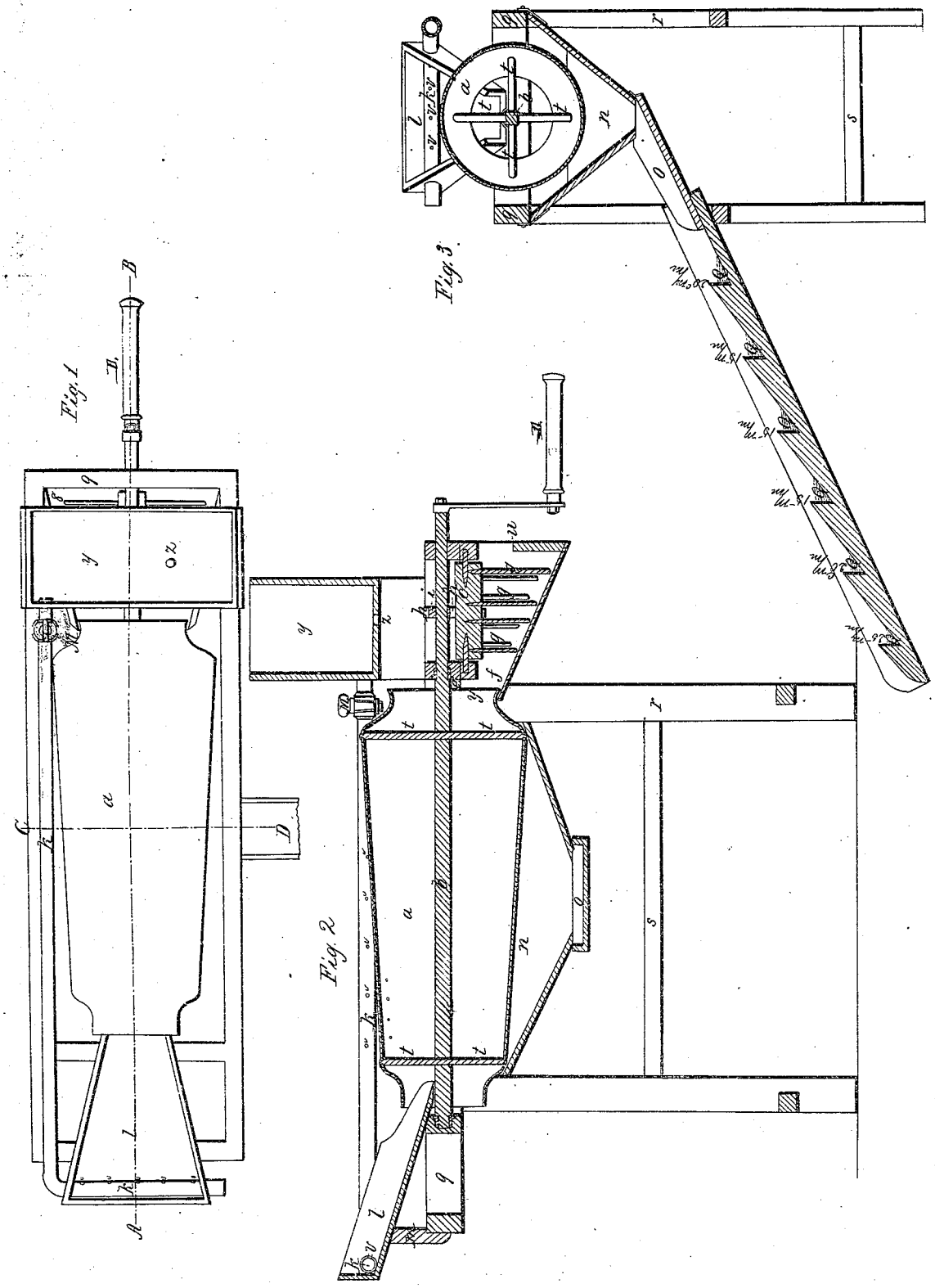
L. LACHARME.

GOLD WASHER AND AMALGAMATOR.

No. 6,771. Patented Oct. 2, 1849.



UNITED STATES PATENT OFFICE.

LOUIS LACHARME, OF ST. LEGER DE FEUGERET, FRANCE.

GOLD-WASHER.

Specification of Letters Patent No. 6,771, dated October 2, 1849.

To all whom it may concern:

Be it known that I, LOUIS LACHARME, of St. Leger de Ferugeret, in France, have invented a new and useful Machine for Washing and Amalgamating Gold; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which make part of this specification.

My invention is designed to perform three distinct operations on the mineral or earthy materials containing gold; first, to separate the fine and coarse gold particles, as well as the fine and coarse earthy materials from each other; secondly, to amalgamate completely the fine gold, and thirdly to wash and separate the coarse particles of gold without the necessity of amalgamating them.

In the drawings Figure 1 is a top view, Fig. 2 a longitudinal vertical section through A, B, (Fig. 1,) and Fig. 3 is a transverse vertical section through C, D, (Fig. 1).

The same letters refer to corresponding parts in all the figures.

a is a cylinder or frustum of a cone, formed of sheet metal, (sheet iron being generally preferred) having numerous small holes perforated through it of a diameter which may vary according to the coarseness of the particles of gold which it is desired to wash without amalgamating them; from one-twentieth to one-tenth of an inch will be the more common diameters.

The cylinder or frustum of cone may in some cases be formed of wire gauze having meshes to correspond with the diameters above specified.

b is an iron axle on which by means of the cross arms *t*, *t*, *t*, *t*, Figs. 2 and 3 the cylinder *a* is fixed and made to revolve by turning the winch *d* or by any other convenient machinery.

c is a wooden vibrating axle having at its lower part projecting teeth or fingers *g*, *g*, *g*, which move within the sheet iron cistern *f*.

h is an iron fork projecting upward from the wooden axle *c*. Between the two prongs of the fork revolves the eccentric or cam *i* causing it to vibrate horizontally, and thus giving to the teeth *g*, *g*, *g*, an alternating movement among the materials which may be contained in *f*, whereby the pieces of gold are allowed to settle below the pebbles and sand.

j is a reservoir for water, part of which descends through the aperture *z* in the bottom of *j* (Fig. 1) and other parts pass along the tube *k* in which is a stop cock to regulate its flow (Figs. 1 and 2). Those holes which are in the longer arm of the pipe *k* project their water on the outside of the cylindrical screen *a;* those in the shorter arm throw their streams among the materials in the ore and water leader *l*, where the ores are placed immediately before they enter the barrel *a*.

m (Fig. 2) is a support for the hopper *l*.

n is a receptacle for the fine material which which passes through the holes in the screen barrel *a*.

o is a spout into which the materials from *n* fall in their way to the amalgamator *h* which I call the cascade amalgamator. This amalgamator is a long trough or conductor, the bottom of which is formed into notches having each a vertical and an inclined surface as seen in Fig. 3. These faces stand inclined in an angle of from 50 to 56 degrees to each other, and the lower part of each notch or angle is filled with mercury, (Q) to such a height as to stand between fifteen and twenty-five thousandths of a meter (from $\frac{6}{10}$ inch to one inch) below the summit of the ridge next below it, as marked on the drawing.

q, *q*, are parts of the frame supporting the screen, and *r*, *r*, its feet, bound together with the cross pieces *s*, *s*.

t, *t*, *t*, *t*, are arms projecting from the axis *b* and at their extremities supporting the barrel or screen *a*.

y is the mouth or exit-end of the barrel *a*, through which the coarser materials, not capable of passing through the holes or meshes in its sides, are emptied into the cistern *f*.

The operation of the machine is as follows:—The sand, earth gravel or crusted ore containing gold is first placed in the hopper *l* from which, by the currents of water issuing from the tube *k* in the back of the hopper, it is washed down into the screen *a* and by means of other jets from *v*, *v*, *v*, *v*, thrown on the outside of the screen and entering through its apertures or meshes, is washed down into the hopper *n*, or, if too coarse to pass through the holes in *a*, is sent forward to *y* and discharged into *f*. With a conical screen turning on a

horizontal axis, as represented in the drawing, the lower surface of the screen has a descent toward the neck *y*, through which the coarser materials are discharged; but a cylindrical screen placed on an inclined axis might also have its lower side inclined toward a contracted mouth, but I have contemplated this only as a modification, which I may at pleasure substitute for the conical formed barrel herein described. The sand and fine gold which pass through the holes of the screen arrive through *o*, at the cascade *p*, every compartment or notched cistern of which contains quicksilver (Q). While the current of water carries the sand and other earthy materials over the surface of the mercury, the particles of gold by their superior specific gravity as well as by their attraction for mercury will sink into it, and be retained in the state of amalgam. The steep descent given to the water passes into each compartment of the cascade, creates a whirling or surging motion in the mercury, whereby the sands and other earthy matters are subjected six or eight times in succession to the contact of mercury and every particle of gold is sooner or later seized upon by the quicksilver, while the escape of the mercury is prevented by the vertical face of the notch.

The coarser particles will not pass through the holes in the screen *a*, but, reaching the cistern *f*, as above stated, are agitated by the teeth *g*, *g*, *g*, whereby the pieces of gold, from their having a much higher specific gravity than sand, are readily allowed to sink to the bottom where they are retained, while the gravel and other lighter materials pass over the edge *u* of the cistern. The vibratory motion is particularly adapted to this purpose of settling the gold.

The flow of water from the cistern *j* is regulated by stop cocks (M) or any other well known form of water regulator, whereby the quantity of water used is adjusted to the requirement of the particular kind of earth or ore to be washed.

What I claim as my invention and desire to secure by Letters Patent is—

1. The combination of the perforated screen *a*, with the ore-and-water leader *l* and the jet tube *k*, whereby the materials capable of passing through the holes of the screen are at once separated from the coarse gold and gravel, and the meshes of the screen are kept perfectly clear.

2. I also claim the agitator *c*, with its fingers *g*, *g*, *g*, so constructed and operating that they can have only an alternating motion, in combination with the cistern *f*, whereby the coarse particles of gold are separated from coarse sand and other materials, while a current of water is flowing over them in the manner herein set forth.

3. I also claim the arrangement in a single machine of the revolving screen *a*, and the amalgamator *h*, the fingers *g g* and the cistern *f*, whereby the washing and amalgamating of gold in fine particles is performed simultaneously at one operation, with the washing and separating of coarse gold from sand and gravel with amalgamation in the manner and for the purposes substantially as herein set forth.

LOUIS LACHARME.

Signed in presence of—
F. W. BEEBE,
SEPTUNE DURANT.