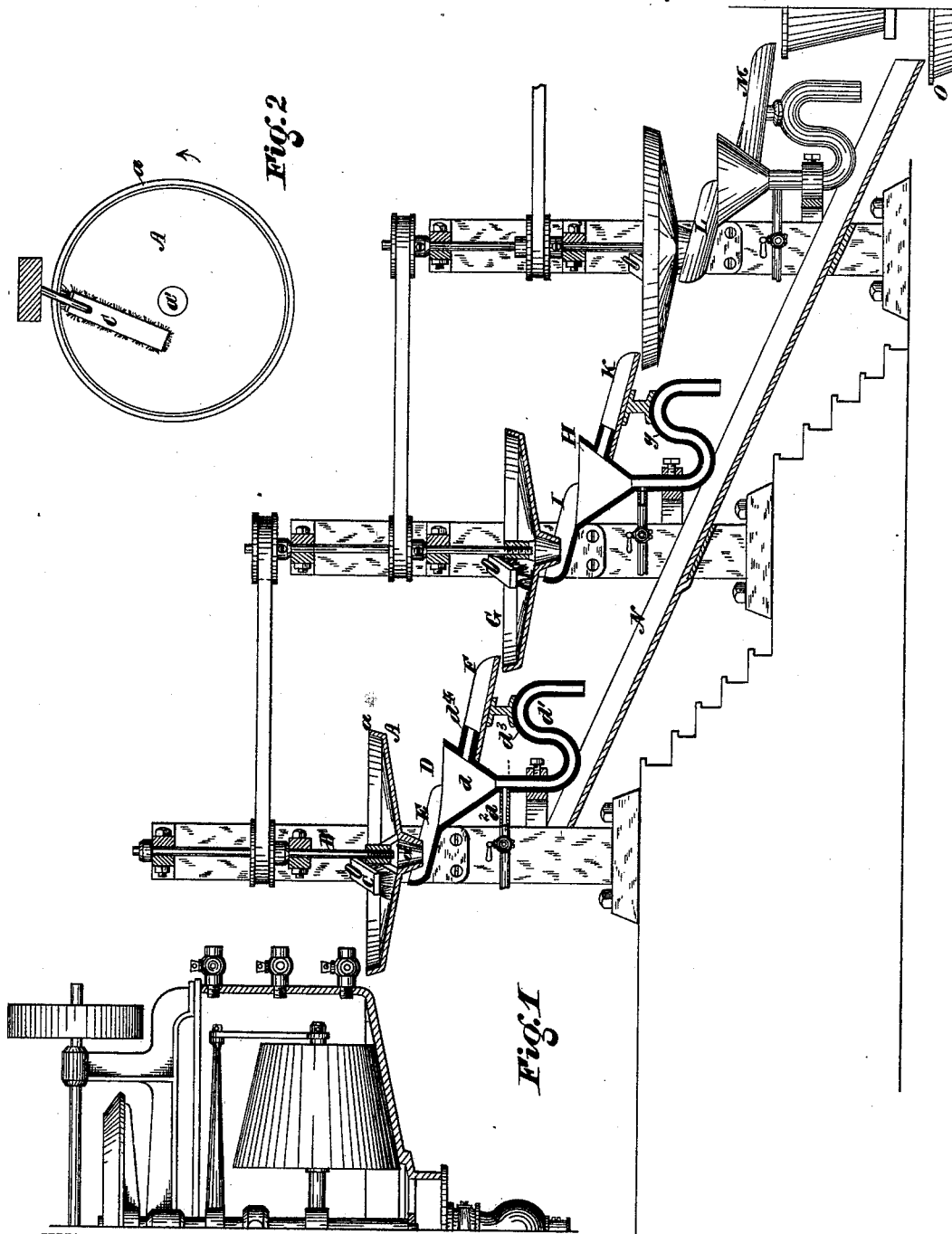


T. A. D. FORSTER & G. J. FIRMIN.
Amalgamator.

No. 214,380.

Patented April 15, 1879.



WITNESSES:

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UNITED STATES PATENT OFFICE.

THOMAS A. D. FORSTER AND GEORGE J. FIRMIN, OF NORRISTOWN, PA.

IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. **214,380**, dated April 15, 1879; application filed February 11, 1879.

To all whom it may concern:

Be it known that we, THOMAS A. D. FORSTER and GEORGE J. FIRMIN, of Norristown, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Amalgamating Ores; and we do hereby 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a longitudinal vertical section of our invention, and Fig. 2 is a detail plan of one of the revolving plates and stationary brushes.

Our invention has reference to that class of amalgamators in which amalgamated copper plates are employed; and our improvements relate to the special construction and combination of parts hereinafter set forth, whereby greater efficiency and increased saving are obtained.

Referring to the accompanying drawings, A indicates a concave copper amalgamated plate, having an upturned edge, *a*, and central discharge, *a'*, said plate being duly secured, in any suitable manner, to a vertical shaft, B, so as to rotate therewith. C is a stationary brush or cleaner, resting on the plate A, and so arranged that it will sweep any material admitted to said plate into the central discharge, *a'*, and at the same time keep the surface of said plate bright or clean.

If preferred, the arrangement of plate and cleaner may be reversed—*i. e.*, the former may be stationary and the latter rotate; but we give preference to the plan shown in the drawings, because the centrifugal force of the rotating plate will throw the gangue out toward the arresting-edge *a*, thus causing a longer retention of the ore on said plate and a more thorough amalgamation.

D represents the receiver, consisting of a hopper, *d*, or other suitably-shaped vessel, having a trap, *d'*, and water-inlet *d''*, the latter being on or about the same level as the bend *d'''* of said trap. Said receiver may also have an overflow-opening, *d''''*; or the overflow may be permitted to pass out over the upper edge

of the vessel. E is a conduit or trough leading from the pan A to the receiver D, and F is another conduit, leading from said receiver D to another pan, G, constructed in all respects like the pan A, and having a like receiver, H. I K L M represent other conduits, pan, and receiver, of construction similar to that already described; and N, a chute common to the various traps, and leading the mercury and amalgam received or issuing from said traps to a single receptacle, O.

The operation is substantially as follows: The mingled ore and mercury, as it flows from the stamp-mill pans or other device—by preference after treatment in the amalgamating apparatus embodied in Letters Patent of the United States dated October 16, 1877, No. 196,212, April 23, 1878, No. 202,804, and August 13, 1878, No. 207,023, issued and granted to us—is received on the revolving amalgamated plate A, the latter, owing to the action of the cleaners, presenting a continually new surface, which amalgamates with so much of the precious metal in the ore as comes in contact with it. The ore, &c., is swept by the cleaners to the central opening, *a'*, falling through said opening on the conduit E, whereby it is conveyed to the receiver D. A considerable portion of the mercury and amalgam contained in the discharge from the pan A is deposited in the trap *d'*, (which is previously charged with mercury up to the dotted line,) while the residue flows out through the opening *d''*, an inflow of water at *d'''* preventing the ore from collecting at the neck of the trap and further diluting the mass, thereby facilitating the collection of any mercury or amalgam that may be carried over to the next amalgamating-pan, G. In said pan G and its receiver H the discharge receives further treatment, as already described, and so on through a series of any desired extent until every extractable portion of precious metal in the ore has been amalgamated, the mercury and amalgam flowing from the traps *d'* *g*, &c., being received in a common receptacle, O, from the chute N, and the waste being permitted to pass away.

It will be noted that the waste or wash carried out of the opening *d''* or over the edge of the receiver D leaves said receiver by a sepa-

rate way from the collected amalgam, the overflow of the latter passing out through the depending leg of the trap d .

What we claim as our invention is—

1. The receiver D, having mercury-trap d^1 and water-inlet d^2 , with separate discharges for the waste and amalgam, substantially as and for the purpose set forth.

2. The combination of concave plate A, having amalgamated surface and central discharge-opening, the brush or cleaner C, and the receiver D, having a trap, d^1 , and water-inlet d^2 , with separate discharges for the amalgam and waste, substantially as shown and set forth.

3. The amalgamating apparatus herein described, consisting of a series of two or more

concave amalgamated plates, A, with central discharges, brushes, or cleaners C, receivers D, having traps d^1 and water-inlets d^2 , with separate waste and amalgam discharges, and conduits connecting said plates and receivers, whereby the gangue is treated by successive like devices to rescue escaping amalgam, substantially as set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 3d day of February, 1879.

THOMAS A. D. FORSTER.

GEO. J. FIRMIN.

Witnesses:

M. D. CONNOLLY,

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