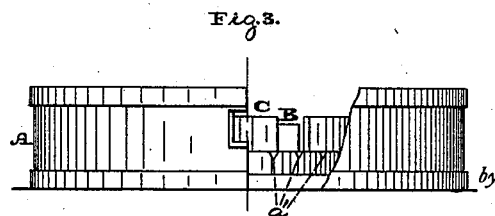
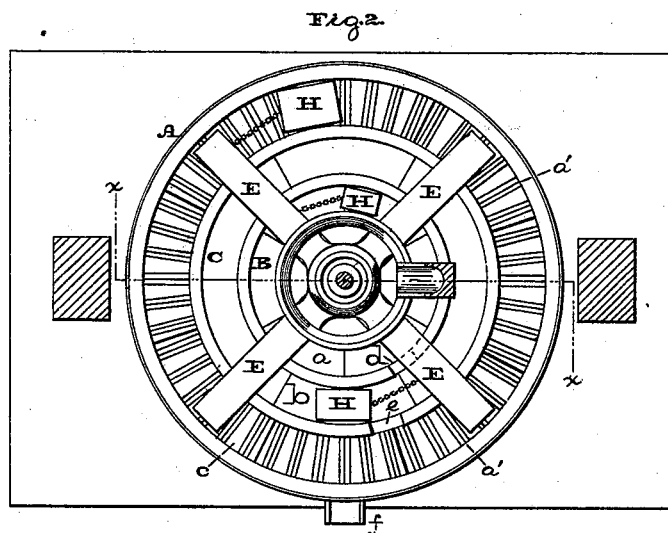
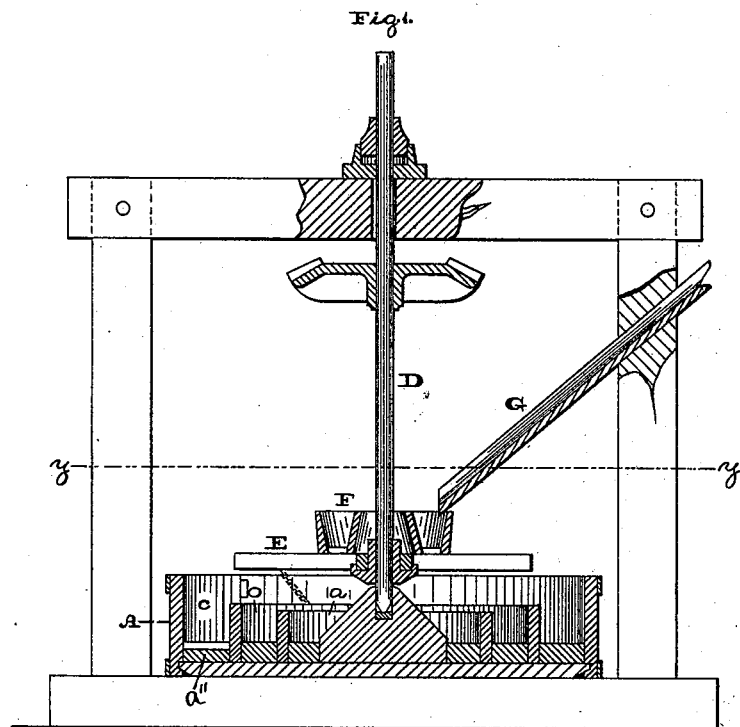


I. M. PHELPS.  
Amalgamator.

No. 215,970.

Patented May 27, 1879.



Witnesses:

No. P. Grant,  
H. F. Leicher

Inventor:

Ira M. Phelps,  
by John A. Diederichs  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

IRA M. PHELPS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN SHILLITO, JR., OF CINCINNATI, OHIO.

## IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. **215,970**, dated May 27, 1879; application filed March 17, 1879.

*To all whom it may concern:*

Be it known that I, IRA M. PHELPS, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Amalgamators, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a vertical section in line *x x*, Fig. 2, of the amalgamator embodying my invention. Fig. 2 is a horizontal section in line *y y*, Fig. 1. Fig. 3 is a side elevation, partly broken away, of a detached portion.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a series of concentric chambers, into the central one of which the pulp is received and the metal thereof burnished, and from thence passed into the surrounding chambers, so as to further burnish the metal, and finally passed into the outer or amalgamating chamber of the series.

The aforesaid chambers are formed by annular partitions, each of which has an outlet, the outlet of an inner partition being in advance radially of that of the next surrounding one, whereby the pulp is moved by the mullers around the entire extent or circle of each chamber of the partition before delivery into the next surrounding chamber.

Referring to the drawings, A represents a tub or pan, and B C two rings or partitions concentric therewith, thus forming three chambers, *a b c*, the number whereof may be increased, if desired, by additional rings.

D represents a rotary shaft, which is supported on a step within the space of the ring B and properly mounted at its upper end. To said shaft is connected a series of radiating arms, E, and a central receiving-pan, F, having an open bottom, with which communicates a spout or chute, G, which, suitably located and supported, is adapted to direct the pulp to said pan F, and attached to the arms E are mullers H, which, respectively, ride on the bottoms of the concentric chambers *a b c*.

In the ring B is an outlet, *d*, which forms a communication between the chambers *a b*, and in the ring C is an outlet, *e*, which forms a communication between the chambers *b c*.

The pan A is provided with a discharge-spout, *f*, and its false bottom, *a''*, is formed with radiating grooves or riffls *a'* for lodgment of the mercury.

It will be seen that the outlet *d* of the inner partition, B, is in advance of the outlet *e* of the next surrounding partition, C, and said outlet *e* is in advance of the discharge-spout *f* of the pan, or, in other words, the outlet *d* is in advance of a radial line drawn between said outlet *d* and the outlet *e*, and the outlet *e* is in advance of a radial line drawn between said outlet *e* and the discharge-spout *f*, the direction of the mullers being considered.

The operation is as follows: Power is applied to the shaft D in any suitable manner, mercury placed in the chamber *c*, and pulp admitted to the pan F. The pulp flows into the chamber *a*, and the muller therein carries it entirely around said chamber until it reaches the outlet *d*, whence it is directed into the chamber *b*, where again it is entirely carried around by the respective muller until it reaches the outlet *e*, where it is caused to enter the chamber *c*, and thus brought in contact with the mercury, the refuse matter discharging through the spout *f*.

It will be seen that the pulp traverses the entire extent of each chamber before being delivered into the surrounding one, whereby the metal is burnished by the mullers, so as to be in proper condition for amalgamation in the chamber *c*, and the mercury resting in the grooves *a'*, which are below the surface of the muller, is not affected or injuriously disturbed by the traversing muller of said chamber.

The amalgam may be scooped from the grooves *a'* or otherwise collected by removing the false floor of the chamber *c*, for which purpose it will be formed in sections.

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

The amalgamating tub or pan A, provided with annular partitions B C, forming chambers *a b c*, the partitions having outlets *d e*, the outlet of one partition being in advance radially of that of the next surrounding partition, whereby the pulp is moved by the muller around the entire extent or circle of each

chamber before delivery into the next surrounding chamber, substantially as and for the purpose set forth.

IRA M. PHELPS.

Witnesses:

JOHN A. WIEDERSHEIM,  
SAML. M. GRICE.