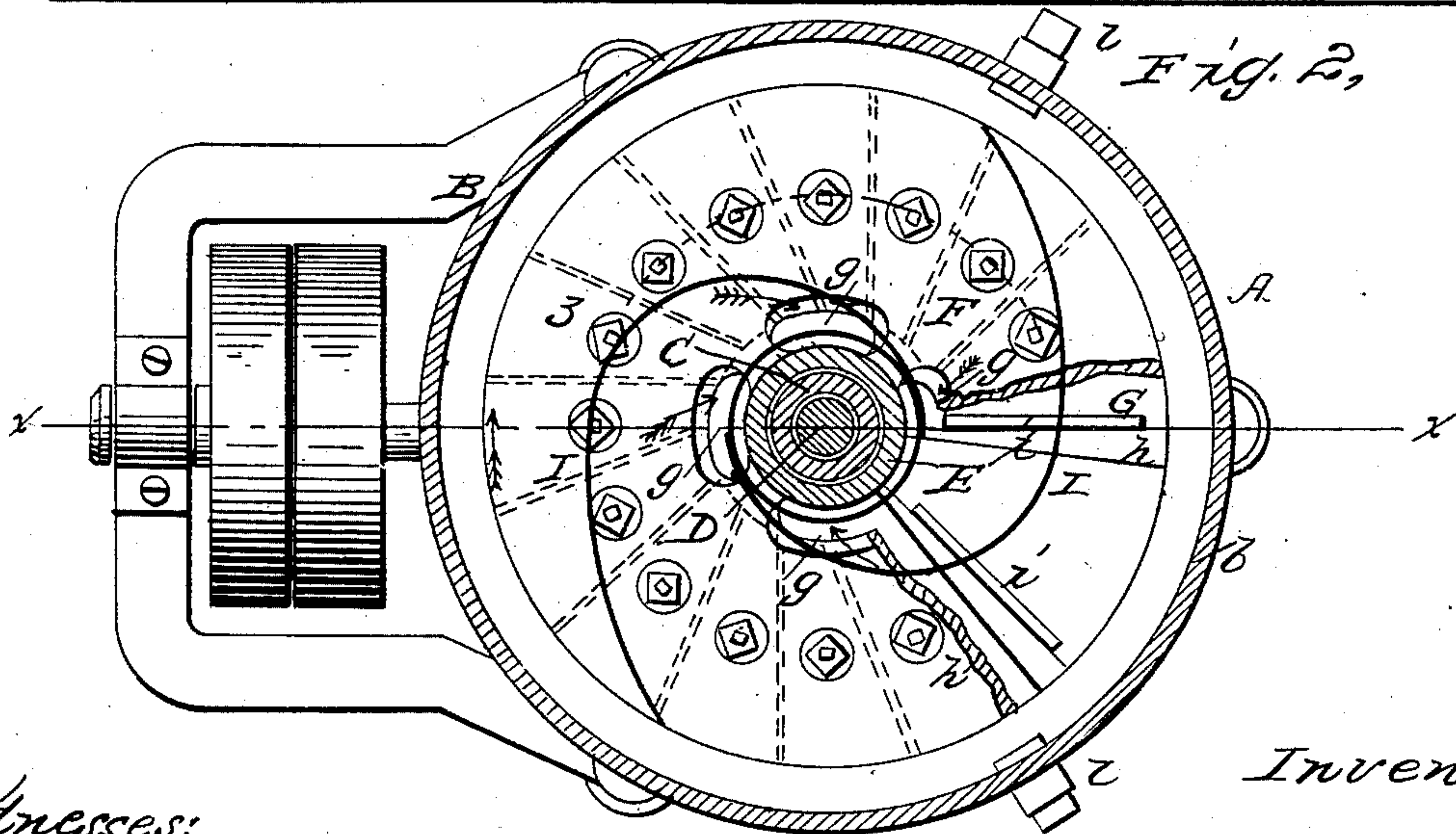
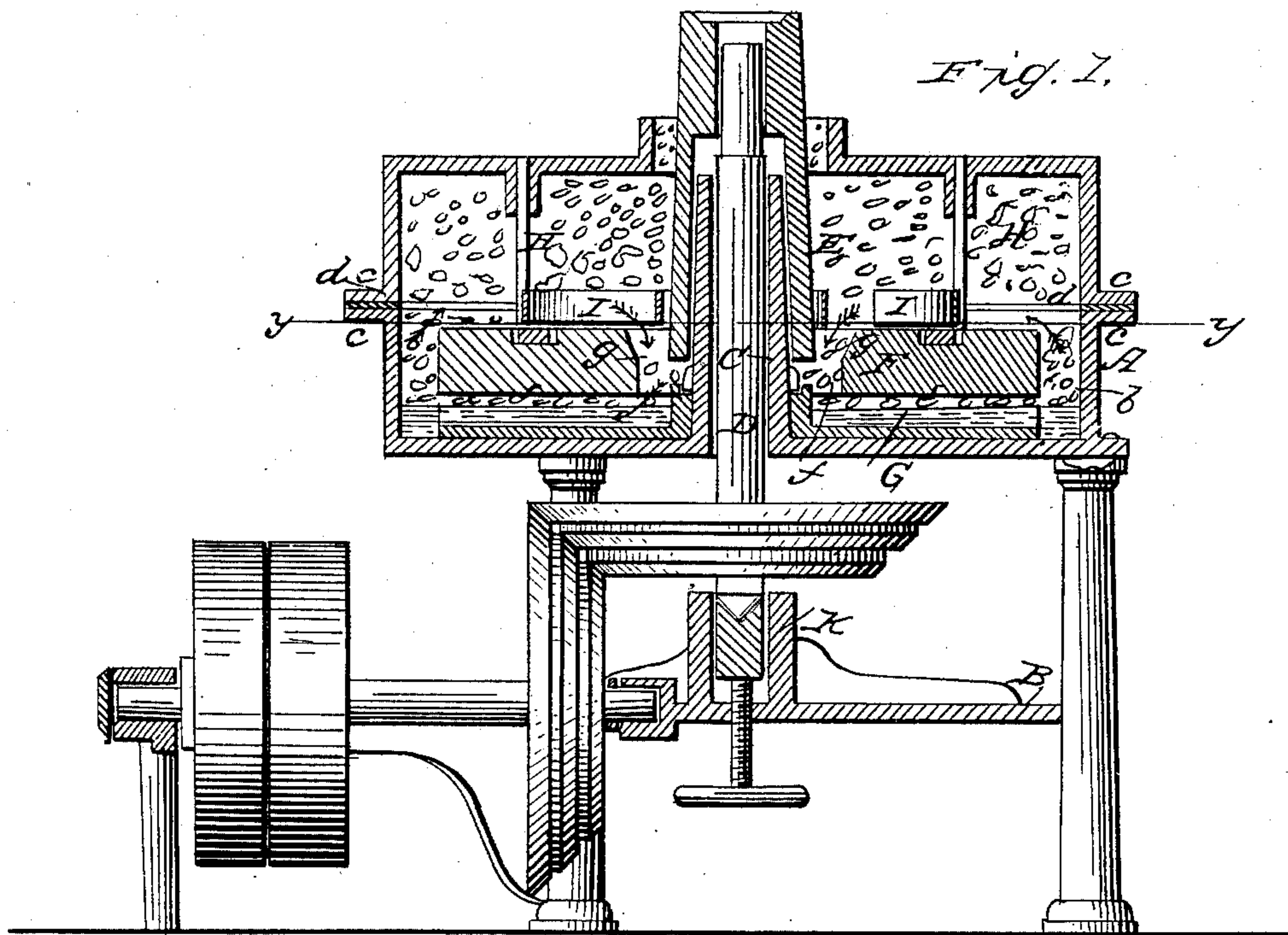


T. VARNEY.

Amalgamator for Gold and Silver.

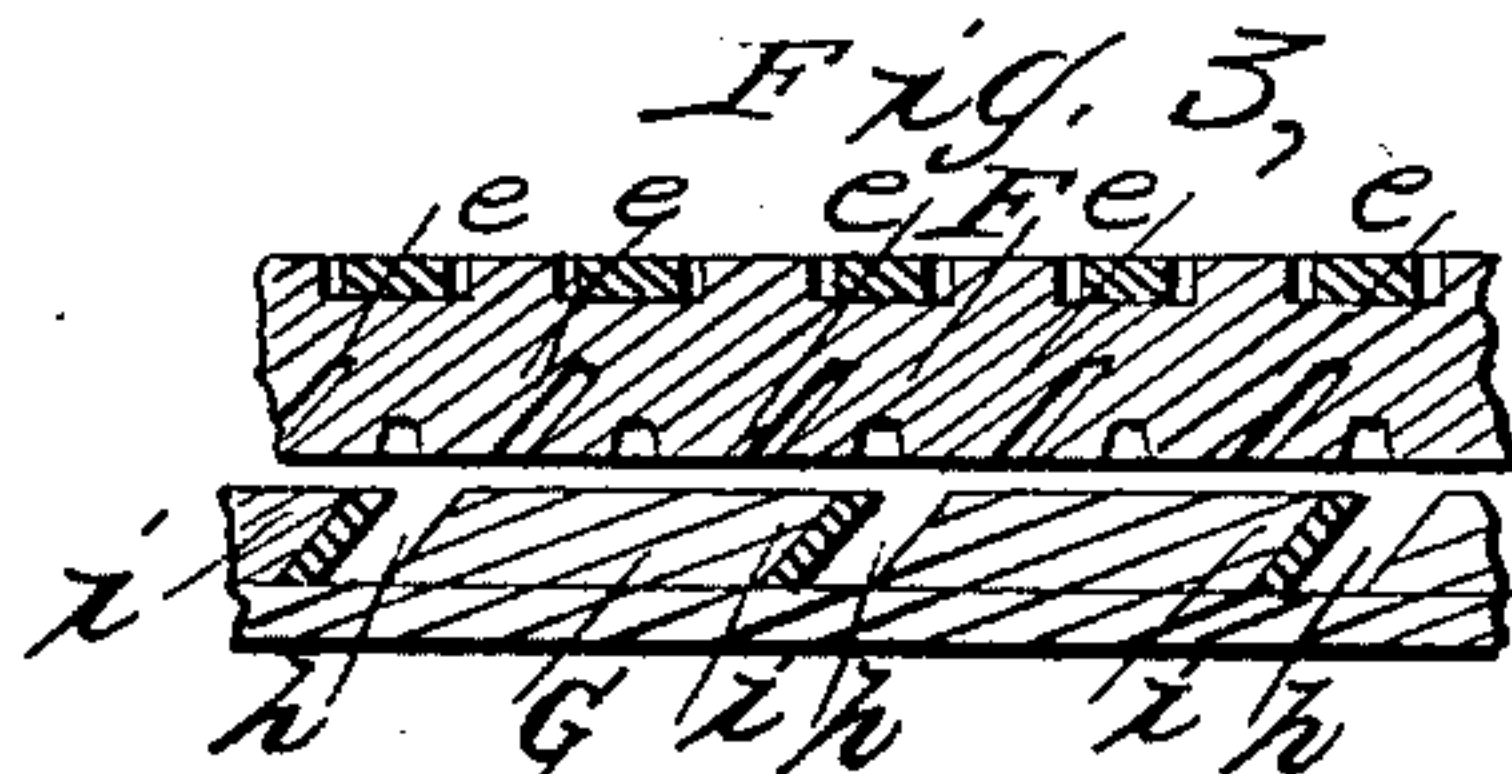
No. 37,185.

Patented Dec. 16, 1862.



Witnesses:

John W. Reed
Geo. Reed



Inventor

Thomas Varney,
per Munn & Co
attorneys

UNITED STATES PATENT OFFICE.

THOMAS VARNEY, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN AMALGAMATORS FOR GOLD AND SILVER.

Specification forming part of Letters Patent No. 37,185, dated December 16, 1862.

To all whom it may concern:

Be it known that I, THOMAS VARNEY, of San Francisco, in the county of San Francisco and State of California, have invented a new and improved amalgamating device, designed more especially for amalgamating silver; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical central section of my invention, *x x*, Fig. 2, indicating the line of section; Fig. 2, a horizontal section of the same, taken in the line *y y*, Fig. 1; Fig. 3, a section of a portion of the same, taken in the line *z z*, Fig. 2.

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

This invention consists in the employment or use of a rotary and stationary muller placed within a suitable pan or tub provided with a cover, and arranged in such a manner that when the device is in operation the ore will pass in a current or stream outward from the center and between the mullers to the circumference of the same, and thence inward over the upper and rotating muller to the center of the same, and down through said muller between it and the lower stationary one, to be again thrown to the periphery of the mullers, thereby causing all the particles of the ore to be brought in contact with the quicksilver in the pan or tub, or with the amalgamated plates attached to the muller or mullers.

The invention also consists in the employment or use of curved or spiral scrapers placed within the pan or tub and arranged relatively with the upper surface of the rotating muller in such a manner as to insure the passage or movement of all heavy substances in the pulp, thereby preventing the same from lodging on the rotary muller.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation with reference to the drawings.

A represents a pan or tub, which is placed on a suitable framing, B. This pan or tub is formed of two parts, *a b*, about of equal dimensions, and provided at their contiguous edges with flanges *c*, through which bolts pass to secure the parts in contact. In order to

prevent leakage, an india-rubber or other suitable packing, *d*, is interposed between the flanges, as shown in Fig. 1.

C is a vertical tube, which is at the center of the lower part, *b*, of the pan or tub, and extends upward some distance above the level of its upper edge. This tube C at its lower part is open, and communicates with the external air in order that a shaft, D, may pass through it. This shaft D projects above the tube C, and upon it there is placed and keyed a tube, E, which fits over the tube C, and is allowed to turn or rotate freely upon it. To the lower end of this tube E there is attached a muller, F, which is a circular disk having slots *e* formed obliquely in its under surface and tangentially with a circular recess, *f*, at the center of the muller at its under or face side. (See dotted lines in Fig. 2.) At the center of the muller F, around the lower end of the tube E, there are openings *g*, the use of which will be presently explained. Directly underneath the muller F there is a stationary muller, G, which is formed of a circular plate having radial slots *h* made in it from its center to its periphery. These slots have an oblique position, and in one side of them there are fitted copper plates *i*, as shown in Fig. 3. At the center of the upper part, *a*, of the pan or tub there is an opening, *j*, through which the pulp passes. This opening is sufficiently large in diameter to admit of the tube E passing up through it and still allow sufficient space for the pulp to pass into the pan or tub.

H H are two vertical rods, which pass through the upper part, *a*, of the pan or tub, and extend down a suitable distance within it. These rods have each a curved or spiral plate, I, attached to it. The shape of these plates is clearly shown in Fig. 2. It will be seen that they extend from a ring, J, which encompasses the tube E, to the periphery of the muller F. The shaft D is driven by gearing or other means below the pan or tub, and the lower end of said shaft is stepped in the framing B, as shown at *k* in Fig. 1.

The operation is as follows: The pulp or crushed ore passes through the opening *j* into the pan or tub, which is supplied with a requisite quantity of quicksilver, the latter filling the slots in both mullers, and the pulp extending above the upper muller, F. The pulp passes down through the openings *g* at

the center of the upper muller, F, and by the rotation of the latter is forced out to the peripheries of the mullers, and passes over the upper surface of the upper muller, F, to the center of the same, and thence down through the openings *g*. Thus a constant circulation is kept up, as indicated by the arrows in Fig. 1, and all the particles of the ore or pulp brought in contact with the quicksilver and the silver amalgamated therewith. The curved or spiral plates I serve as scrapers, and prevent heavy substances which may be contained in the pulp from resting or lodging on the upper surface of the muller F, insuring the passage of the former along with the current.

By having the pan or tub formed of two parts, as shown, a large quantity of ore or pulp is admitted into the pan or tub, and the amalgamating process is greatly expedited thereby. The pan or tub A is provided with discharge openings or tubes *l*.

I do not claim, broadly, a muller provided

with slots or recesses and copper plates, for that has been previously used; but,

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

1. The employment or use of a rotating muller, F, provided with central openings, *g*, and arranged within a pan or tub, A, with a stationary muller, G, or an equivalent bed-plate, substantially as shown, to insure a current or circulation of the pulp within the pan or tub and between the mullers, as and for the purpose set forth.

2. A covered or close pan or tub, A, composed of two parts, *a b*, connected together, when said pan or tub is used for an ore-amalgamating device, as specified.

3. The curved plates or scrapers I, arranged to operate in connection with the rotary muller F, for the purpose herein set forth.

Witnesses: THOMAS VARNEY.

ALFRED RIX,

C. MORRILL.