

S. W. WOOD.

Separating and Collecting Gold and Silver Amalgams.

No. 41,565.

Patented Feb. 9, 1864.

Fig. 1

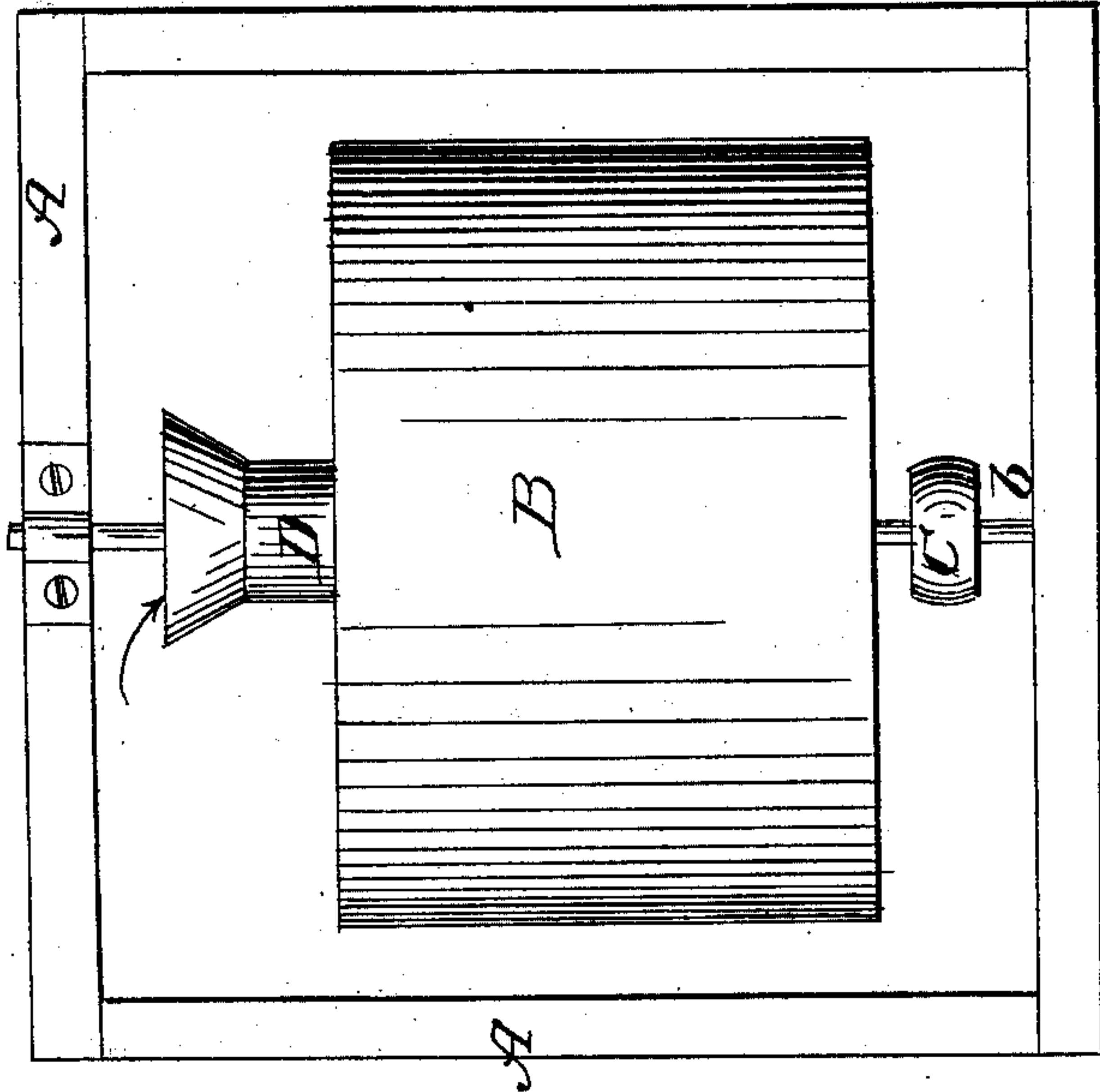
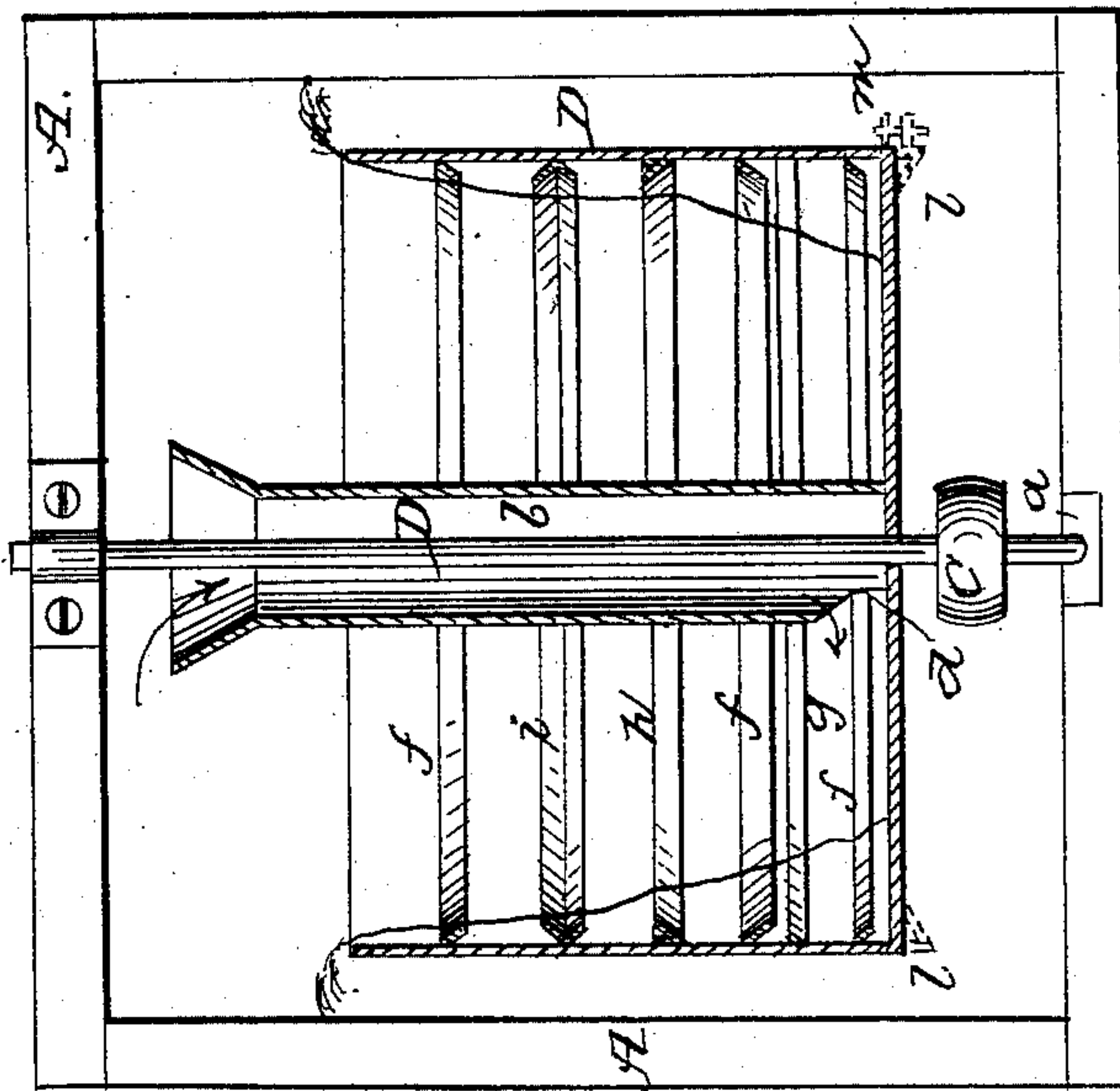


Fig. 2



Witnesses  
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# UNITED STATES PATENT OFFICE.

S. W. WOOD, OF CORNWALL, NEW YORK.

## IMPROVEMENT IN SEPARATING AND COLLECTING GOLD AND SILVER AMALGAMS.

Specification forming part of Letters No. **41,565**, dated February 9, 1864.

*To all whom it may concern:*

Be it known that I, S. W. WOOD, of Cornwall, in the county of Orange and State of New York, have invented a new and Improved Gold Amalgam Separator; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a side elevation of an apparatus embodying my invention. Fig. 2 is a central vertical section thereof.

Like letters designate corresponding parts in both figures.

The special object of my invention is to separate amalgamated gold from the finely-pulverized quartz or other rock in which it is produced, and with which its particles are so minutely mixed after the process of amalgamation that much difficulty is ordinarily experienced in effecting its separation therefrom and gathering its particles together in a mass. These particles are so extremely small that even the greater specific gravity of the amalgam is not sufficient to effect the separation by any known method, and when agitation is added to the process the particles are rather commingled with the impalpable powder of the rock than separated.

The nature of my invention consists in the application of centrifugal action to the material to be separated in such a manner as to separate the amalgam by its greater momentum derived from the revolution of the vessel in which it is contained, and to collect it at the extreme part or periphery of the vessel, and, in combination therewith, the use of suitable amalgam collectors or gatherers, attached to or forming part of the apparatus, to secure the amalgam once separated in a mass; also, in the admission of the material to be separated at the bottom of the vessel near the center, and the discharge of the refuse mass by overflowing at the top, produced by the excess of centrifugal force over that of gravity.

In the drawings is represented a simple form of apparatus to embody and illustrate the principles of my invention. In a suitable frame, A, is mounted on a vertical shaft, *b*, a vessel, B, which may be of cylindrical or any other suitable form and open at the top. To this vessel the requisite revolving motion is

imparted by power applied to a pulley, C, on its shaft, or otherwise. Around the shaft *b* is a spout or tube, D, either stationary or revolving with the shaft, for feeding the material into the vessel, so as to reach the bottom thereof before it can be subjected to the centrifugal action. The spout is, of course, open at the lower end, *d*. Into this vessel, through the spout D or its equivalent, the pulverized material containing the amalgam, mixed with sufficient water to give it fluidity, is introduced and submitted to the centrifugal action of the revolving motion imparted to the vessel. The effect is to cause the whole mass to leave the center of the vessel and cling to the inner periphery thereof, which is of considerable height—as great as may be desired—and vertical, or nearly so. The material will thus rise against the periphery till a portion overflows the rim or upper edge of the vessel and runs off.

The rapidity with which the mass will rise and flow off depends upon the velocity of the revolution and the rate at which it is introduced into the vessel, and the proper speed and rate are to be determined by the rate at which the amalgam completely separates from the refuse.

The form which the whole revolving mass assumes is illustrated by the blue lines in Fig. 2. This operation brings into action both the forces of gravity and centrifugal motion to separate the amalgam from the pulverized rock and the water, for the greater weight of the particles of amalgam causes them to seek with greater momentum the outermost distance from the center of revolution, and thereby reach the inner periphery of the vessel by themselves, while their greater gravity causes them to remain at or near to the bottom, and the pulverized rock with the water are forced upward against the action of gravity of the centrifugal force. At the same time that these powerful separating forces are in action the mass is but very slightly agitated, thereby favoring the separation by not re-commingling the particles once separated.

The comparatively thin sheet or stratum (so to speak) of the mass through which the particles of amalgam have to traverse to reach entire separation at the periphery of the vessel also facilitates the process. The refuse of



water and pulverized rock is continuously discharged by overflowing at the upper edge of the vessel, so that the operation may be perpetual, instead of being intermitted in batches, till the vessel has to be emptied of the accumulated amalgam.

To assist further in the separation, and to furnish the means of surely gathering and collecting the amalgam, I contemplate using annular troughs, ledges, or plates on the inside of the periphery of the vessel, different forms, positions, and arrangements of which are indicated at *f g h i* in Fig. 2. These are removable and replaceable, and may fit freely or loosely inside of the vessel, so as to allow the amalgam to flow down to the bottom between them and the sides of the vessel; or if in trough form they collect and retain some of the amalgam, so that they are to be removed occasionally to gather the same. The surface of the vessel and of the annular troughs or plates may be amalgamated, if desired.

The greater part of the amalgam collects at the extreme outer corner of the vessel at the bottom; and this may be sunk or hollowed out, as indicated in red lines at *l*, Fig. 2, so as better to contain and retain a considerable quantity of amalgam and facilitate the removal thereof through a faucet or tap, *m*.

This invention is applicable to the separa-

tion of the amalgam of silver and other metals from the refuse of the ore.

I do not confine myself to the special contrivance above described.

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

1. Separating the amalgam from the pulverized rock by centrifugal force imparted to the vessel in which it is contained, the same acting in conjunction with gravity to gather and collect in a mass the amalgam at the periphery of the vessel, substantially as herein specified.

2. Introducing the material through the spout D or its equivalent, so as to bring it to the bottom of the vessel before being subjected to the centrifugal action thereof.

3. Discharging the refuse rock and the water by overflowing at the upper edge of the vessel, the said overflowing being produced by the centrifugal force acting against that of gravity, substantially as herein set forth.

4. The annular troughs, ledges, or plates on the inner periphery of the revolving vessel, substantially as and for the purpose herein set forth.

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Witnesses:

J. S. BROWN,

S. W. POWELL.