

J. T. TERRY, Jr.
ORE CONCENTRATING APPARATUS.
APPLICATION FILED MAR. 13, 1916.

1,362,370.

Patented Dec. 14, 1920.

Fig. 1.

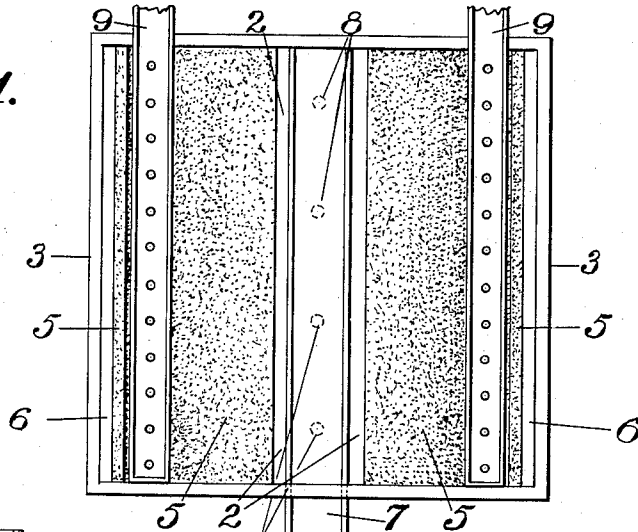


Fig. 2.

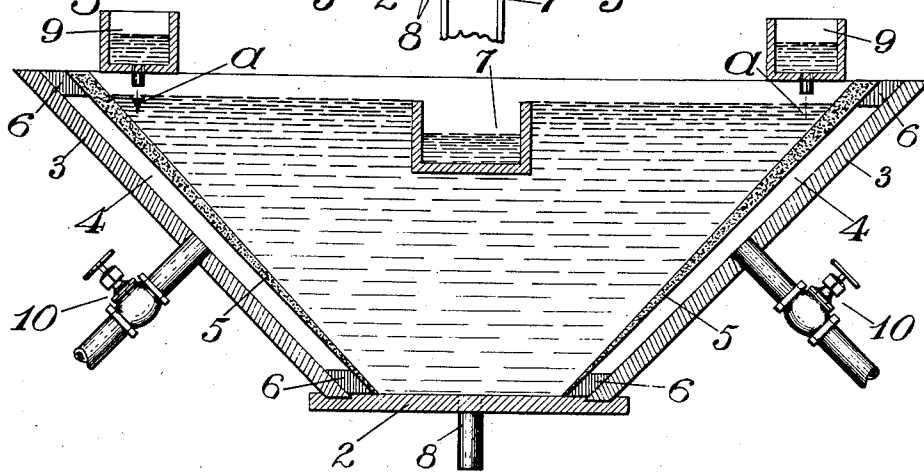
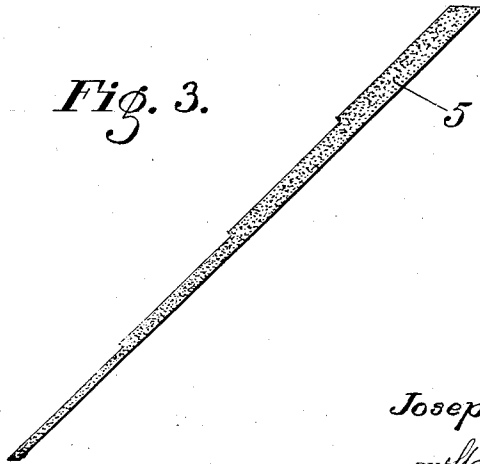


Fig. 3.



WITNESSES:

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ORE-CONCENTRATING APPARATUS.

1,362,370.

Specification of Letters Patent. Patented Dec. 14, 1920.

Application filed March 13, 1916. Serial No. 83,844.

To all whom it may concern:

Be it known that I, JOSEPH T. TERRY, JR., a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented new and useful Improvements in Ore-Concentrating Apparatus, of which the following is a specification.

This invention relates to an ore concentrating apparatus.

One of the objects of the present invention is to provide an improved pneumatic agitation apparatus in which flotation concentration of ores may be more efficiently carried on. The apparatus consists of a trough-shaped container or tank having sloping sides or bottom supporting a porous medium, decreasing in density or thickness with depth, said decrease in density being proportional to the hydrostatic head. Another object is to provide a greater surface area for the ore treated, thereby permitting a more efficient and effective action of the disseminated air or gas in carrying out the operation of concentrating ores by oil flotation. Further objects will hereinafter appear.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a plan view of the apparatus.

Fig. 2 is a cross section of same.

Fig. 3 is a detail view of the porous medium, showing a modified structure of same.

Referring to the drawings in detail, A indicates, in general, a trough-shaped tank or container, provided with a bottom section 2 and sloping sides 3. Spaced with relation to the side sections 3 and running approximately parallel therewith to form an air chamber 4 is a porous partition member 5, which may be constructed of felt, canvas, earthenware, or any other suitable porous material. The porous section 5 is held in position by a pair of cleats 6 and decreases in thickness from the upper edge to the lower edge in proportion to the hydrostatic head of the tank. The decrease of density or thickness of the porous medium may be gradual, as shown in Fig. 2, or may be made in a series of steps, as shown in Fig. 3, thus causing air or gas, under pressure, admitted to chamber 4 to pass therethrough in a fine

state of subdivision, producing a constant agitation of the material within the tank and a more perfect frothing or liberation of the concentrates.

The tank is also provided with a discharge launder 7 for the reception of the froth. This launder is positioned centrally in the tank and extends lengthwise of same, thus permitting a free and perfect discharge of the frothy formation at all points. The bottom section 2 is also provided with a plurality of discharge openings 8 for the liberation of the treated or waste material.

Suitably supported adjacent to each porous side section 5 is a supply launder 9 which delivers the material to be treated. This material discharging from the bottom of the troughs 9 descends in the direction of the arrows *a*, against the upper ends of the porous sides 5, and is thus subjected to the disseminating action of the air or gas which is constantly discharged through the porous sides 5 and the fluid contents within the tank. The porous medium, which decreases in thickness or density with depth, tends to equalize the discharge of air or gas under the unequal hydrostatic head and, therefore, eliminates the necessity of using more than one compartment 4 on a side, valves, etc., and permits of a more simple and cheaper construction.

The gradually rising air or gas passing through the fluid medium in the tank causes a frothing or liberation of the mineral particles or concentrates carried by the ore treated, and as the froth gathers upon the surface a constant discharge is permitted at all points as the trough 7 extends centrally through the tank.

The advantage gained by using a porous medium supported and attached to the sides, as here shown, is the presentation of a greater surface than heretofore has been available. A more efficient and effective action of the disseminated air or gas, in carrying out the operation of concentration by flotation, is thus permitted as the greater area available for the ore to pass over permits the several particles of the ore to be again and again subjected to the action of the air or agitation medium passing through the porous material and the fluid contents of the tank.

This will be more readily understood by the following explanation: The ore pulp

discharging from the launders 9 will strike the upper edge of the porous sides 5 and will immediately be acted on by the rising air or gas. A great quantity of mineral will at first be liberated, but many particles might possibly escape unless a considerable area is provided, as here shown, for the ore pulp to pass over. Any material that is not acted upon at the upper section is thus given plenty of opportunity to come in contact with the agitating medium before the bottom 2 is finally reached. Similarly, less agitation or pressure on the air admitted is necessary and will, therefore, prevent carrying over with the froth of waste material which should discharge through the openings 8 formed in the bottom. Any waste material which might have been carried to the surface by rising particles, near the upper edge, will be given an opportunity to settle before the trough or final discharge 7 is reached.

The apparatus as a whole is simple and substantial in construction, is cheap to manufacture and easily controlled as only two air valves 10 are required, one for each side. The materials and finish of the several parts of the apparatus are such as the experience and judgment of the manufacturer may dictate.

I wish it understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims and that I do not wish to limit myself to the specific design and construction here shown.

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

1. In an ore concentrating apparatus of the flotation type, a trough-shaped, solution-

containing tank having inclined sides, a porous body therein spaced from each side to form an air chamber adjacent to each side, said porous bodies decreasing in thickness from top to bottom, means for admitting a fluid under pressure into said chamber, said porous bodies adapted to disseminate the fluid and deliver same in numerous fine bubbles into the solution contained in the tank to cause agitation and frothing of same, means for delivering the ore pulp to be concentrated at a point near the upper edge of each porous body, and a discharge trough for the froth extending centrally through the tank.

2. In an ore concentrating apparatus of the flotation type, a trough-shaped, solution-containing tank having inclined sides, a porous body therein spaced from each side to form an air chamber adjacent to each side, said porous bodies decreasing in thickness from top to bottom, means for admitting a fluid under pressure into said chambers, said porous bodies adapted to disseminate the fluid and deliver same in numerous fine bubbles into the solution contained in the tank to cause agitation and frothing of same, means for delivering the ore to be concentrated at a point near the upper edge of each porous body, a discharge trough for the froth extending centrally through the tank, and a plurality of discharge openings in the bottom of the tank for the removal of the gangue.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH T. TERRY, Jr.

Witnesses:

W. W. HEALEY,
M. E. EWING.