

C. C. HAVER.
PULP AGITATOR.
APPLICATION FILED JUNE 15, 1911.

1,020,694.

Patented Mar. 19, 1912.

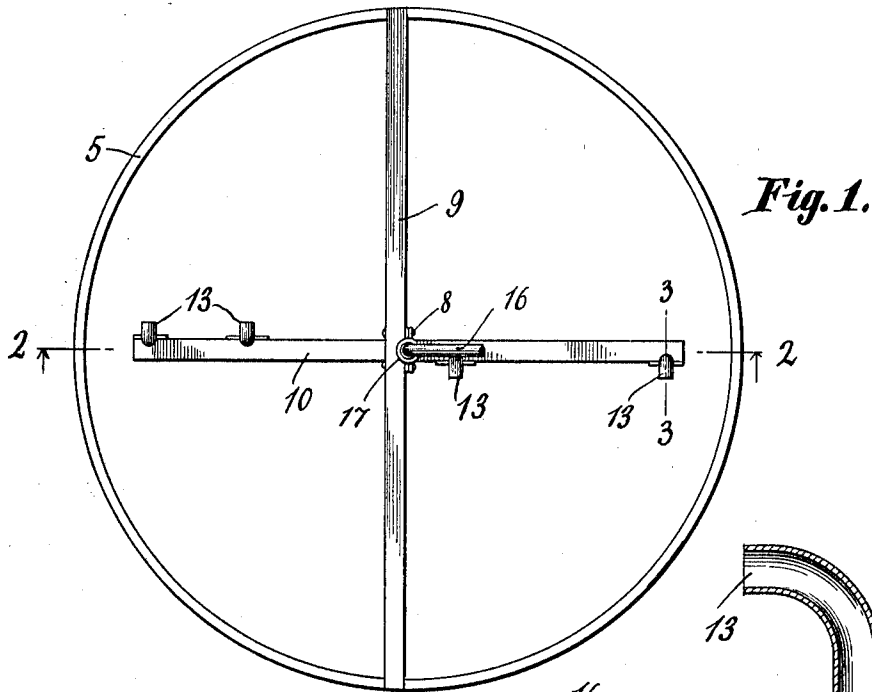


Fig. 1.

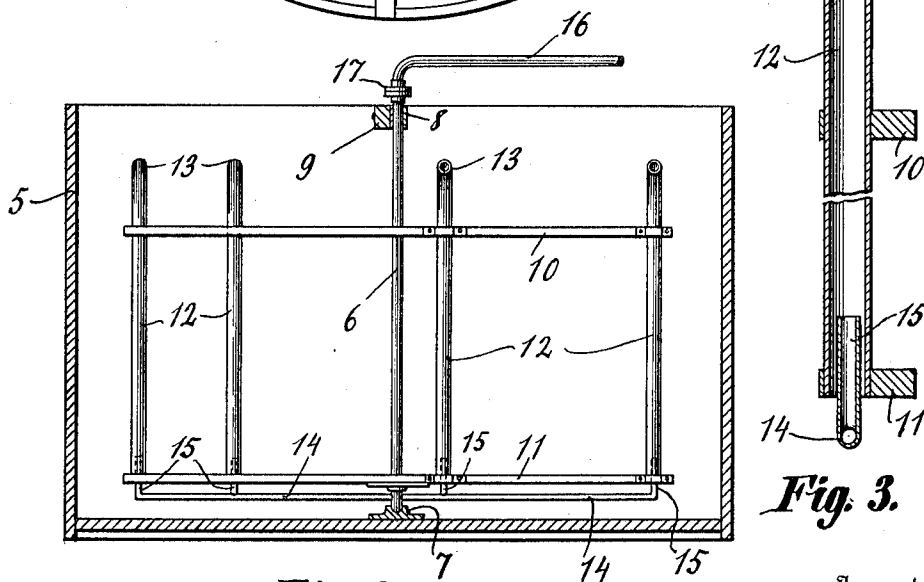


Fig. 2.

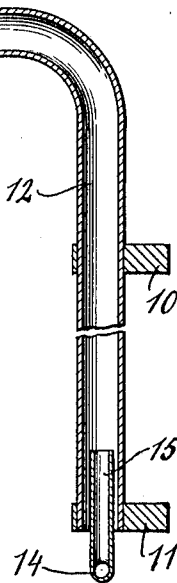


Fig. 3.

Inventor

Witnesses
Ed Larson
M. Schmidt

Charles C. Hafer

By *Wm. H. Stevens & Co.*

Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES CLAUDIUS HAFFER, OF PHOENIX, ARIZONA.

PULP-AGITATOR.

1,020,694.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES CLAUDIUS HAFFER, a citizen of the United States, residing at Phoenix, in the county of Maricopa and State of Arizona, have invented certain new and useful Improvements in Pulp-Agitators, of which the following is a specification.

The present invention relates to apparatus for agitating pulp in metallurgical mills in order to extract its metallic or mineral contents by chemical solution with which the pulp is brought in contact. The apparatus may also be used for washing clay, kaolin, fullers' earth and other industrial products.

The invention has for its object to provide an apparatus of the kind stated, embodying the principle of the ordinary power driven rotor agitator and the air lift agitator; and to this end it consists in a novel construction and arrangement of parts to be hereinafter described and claimed.

In order that the invention may be better understood, reference is had to the accompanying drawing forming a part of this specification, in which drawing—

Figure 1 is a plan view of the apparatus. Fig. 2 is a vertical cross section on the line 2—2 of Fig. 1. Fig. 3 is a cross section on the line 3—3 of Fig. 1.

Referring specifically to the drawing, 5 denotes the tank which receives the pulp and chemical solution for extracting the metallic or mineral particles from the former. In the center of the tank is mounted a rotatable hollow vertical shaft 6 supported at its lower end on a step 7, and at its upper end in a bearing 8 carried by a beam 9 extending across the top of the tank. The shaft 6 carries upper and lower arms 10 and 11, respectively, extending radially from opposite sides of the shaft. These arms are fastened to the shaft so that they will revolve therewith, and they carry vertical pipes 12 which are open at both ends. The lower ends of the pipes are near the bottom of the tank, and their upper ends terminate in lateral horizontal bends to form jet nozzles 13. To the lower end of the shaft 6 are connected, so as to communicate therewith, small pipes 14 which extend radially beneath the lower arm 11, and have upwardly extending discharge nozzles 15 which project centrally into the lower ends of the pipes 12. The air passing down the

shaft 6 is therefore delivered into the lower ends of the pipes 12, and it flows upwardly through said pipes and discharges from the nozzles 13. At 16 is indicated a pipe which leads to a suitable supply of compressed air, and is connected to the upper end of the shaft 6 by a suitable swivel joint 17 so as to permit rotation of said shaft.

The pipes 12 serve as agitators to stir up the contents of the tank. The operation is as follows: The tank is nearly filled with pulp consisting of solids and the chemical solution. Air is then turned on from the compressor, whereupon it flows down the shaft 6, and is discharged from the nozzles 15 into the pipes 12, from which latter it is discharged by passing out of the nozzles 13. The suction produced by the passage of the air upwardly through the pipes 12 draws in pulp through the lower ends of said pipes, and the pulp flows upwardly with the air and is discharged from the nozzles 13. This discharge of pulp from the nozzles takes place almost immediately after the air is turned on. As soon as the pulp is sufficiently thinned (by the mixing resulting from pumping the thick material from the bottom and discharging it into the thin liquid at the top), the pipes 12 commence to revolve as the result of the reaction due to the discharge at high velocity from the nozzles 13. The pipes 12 therefore revolve in the pulp, and serve to stir up the same, and they can be kept in motion as long as necessary to insure complete agitation of the contents of the tank.

I claim:

1. The combination of a receptacle, a rotary agitator therein which is hollow to permit flow of the contents of the receptacle therethrough the inlet being at the bottom and the outlet at the top, and said agitator being impelled by the reaction due to the discharge therefrom of the contents of the tank, and means for producing suction in the agitator to induce the flow through and the discharge therefrom of said contents.

2. The combination of a receptacle, a rotary agitator therein which is hollow to permit flow of the contents of the receptacle therethrough the inlet being at the bottom and the outlet at the top, and said agitator being impelled by the reaction due to the discharge therefrom of the contents of the tank, and means for discharging air through the agitator to produce suction therein to in-

duce the flow through and the discharge therefrom of the contents of the tank.

3. The combination of a receptacle, a rotary agitator therein, said agitator comprising 5 vertically arranged pipes through which the contents of the receptacle can flow and discharge back into the receptacle, said agitator being impelled by the reaction due to the discharge therefrom of the contents of 10 the tank, and means for producing suction in the pipes to induce the flow through and the discharge therefrom of said contents, the inlet being at the lower ends of the pipes and the outlet at the upper ends thereof.

15 4. The combination of a receptacle, a hollow vertical shaft mounted therein and connected to a source of compressed air, verti-

cally arranged pipes carried by the shaft and radially spaced therefrom, said pipes being open at their lower ends and having 20 laterally extending discharge nozzles at their upper ends, and pipes connected to the aforesaid shaft and discharging into the lower ends of the first-mentioned pipes, to produce suction therein to induce the flow 25 through and the discharge therefrom of the contents of the tank.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES CLAUDIUS HAFFER.

Witnesses:

B. E. MARKS,

RAY R. WINANT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
