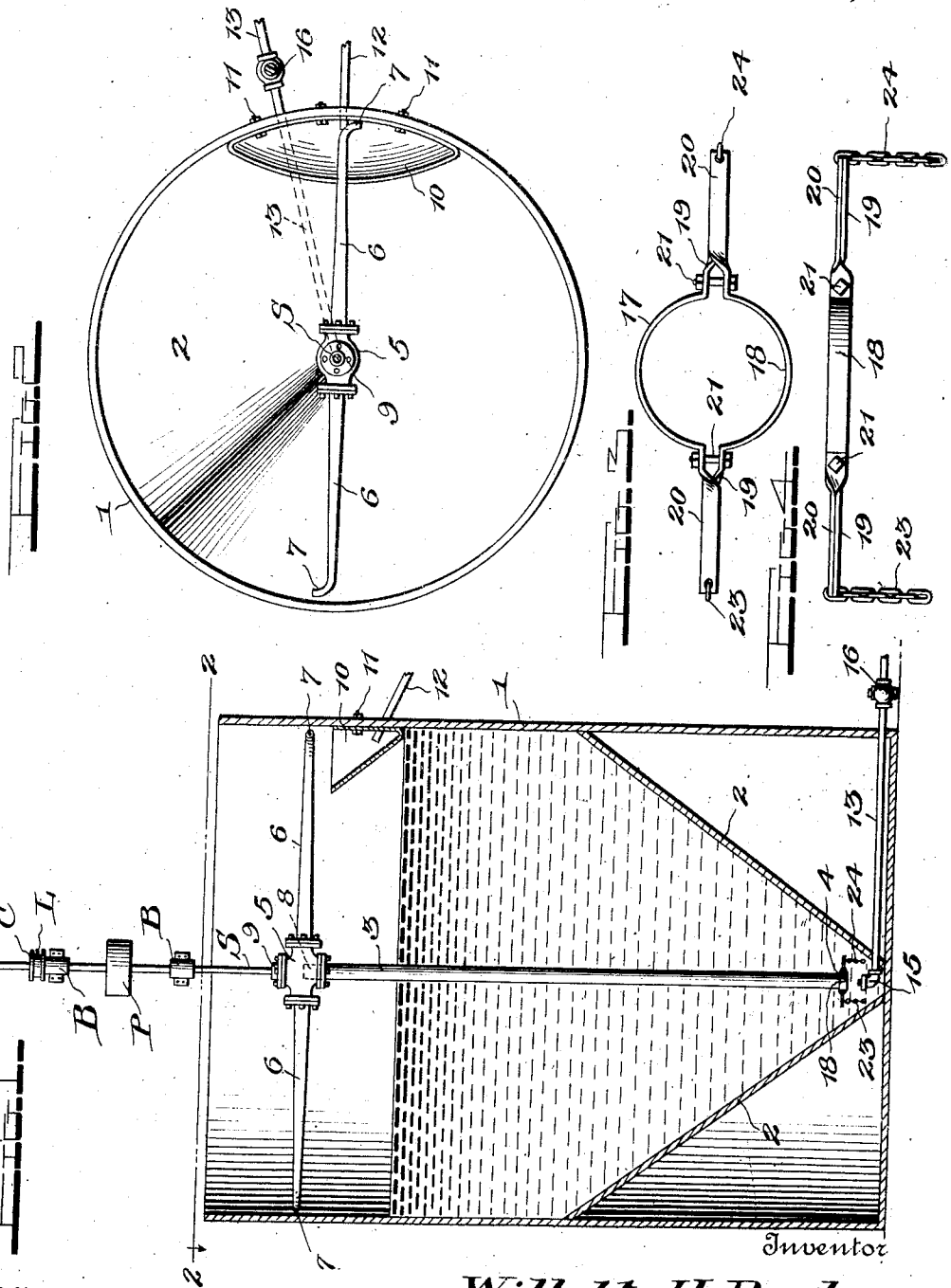
W. H. BARTON.

AGITATING MACHINE.

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**1,204,733.**

Patented Nov. 14, 1916.



Witnesses

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# UNITED STATES PATENT OFFICE.

WILLETT H. BARTON, OF SAN DIEGO, CALIFORNIA.

## AGITATING-MACHINE.

1,204,733. Specification of Letters Patent. Patented Nov. 14, 1916.

Application filed August 23, 1915. Serial No. 46,997.

*To all whom it may concern:*

Be it known that I, WILLETT H. BARTON, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented certain new and useful Improvements in Agitating-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in agitating machines, and more particularly to a machine for the agitation of pulp, comprising ground gold, silver, or copper ore in a cyanid solution or acid solution, and the object of this machine is to produce a continuous suspension of finely divided material in the solution or pulp.

Another object of this invention is to provide during the agitating operation of this machine, means for automatically transferring the charge of pulp from one tank to another.

A further object of the invention is to provide a device which is simple and durable in construction, inexpensive to manufacture, and one which will be very efficient in operation.

With these and numerous other objects in view, my invention consists of the novel features of construction, combination and arrangement of parts which will be herein referred to and more particularly pointed out in the specification and claims.

In the accompanying drawings, Figure 1 is a central vertical longitudinal section of the agitating machine; Fig. 2 is a top plan view of the same; Fig. 3 is a plan view of the additional agitator before the same is applied; Fig. 4 is a side elevation of the same.

In describing my invention I shall refer to the accompanying drawings in which similar reference characters designate corresponding parts throughout the several views and in which the numeral 1 indicates a tank having an inverted conical bottom 2. This tank 1 is adapted to receive a pulp or solution which is required to be stirred or agitated, and may be constructed of any desired material for instance, wood, metal, or other durable material such as is applicable for use in devices of this character.

The tank 1 has positioned therein a vertically disposed pipe 3 having an open lower end 4 disposed contiguous to the apex of the inverted conical shaped bottom 2 of the said tank. The upper end of the vertical pipe 3 has secured thereto, a casing 5 which has projecting therefrom, a plurality of radial tubular arms 6. These tubular arms 6 have their extremities bent laterally as shown at 7 in the same direction, so that the pulp when projected therethrough will not strike directly against the inner wall of the tank 1, adjacent which the extremities of said arms 6 are disposed. The upper end of the pipe 3 projects a short distance into the casing 5 as shown at 8, so that the same will be on a level with the outlets of the same which are connected with the arms 6. These arms 6 are shown in this instance as comprising a pair of radially projecting tubes, but any desired number may be applied to the said casing.

The pipe 3 and arms 6 are supported in the tank 1 by means of the steel shaft S which projects upwardly from said tank and is held in a vertical position by means of brackets or bearings B attached to a frame or support not shown in the drawings. The upper bearing B supports the mechanism by means of a collar C attached to the shaft S, by means of a set screw L. This shaft S is secured to the top of the casing 5 at its lower end as shown at 9 by any desired means, and the shaft S has positioned thereon between the bearings B, a pulley P which is adapted to connect with some outside power to rotate the shaft and hence rotate the pipe 3 and the arms 6 for a purpose to be hereinafter more fully described. The arms 6 are made to taper from the joint, at which they connect to the casing 5, to their ends, so that the width of the smaller end is one-half the width of the larger end to provide a uniform velocity throughout their length. This mechanism is so positioned in the tank 1 that the radially projecting arms 6 will be positioned a predetermined distance above the pulp in the said tank, and spaced below the arms 6 and above the pulp in said tank at a point on the inner surface of the tank, is a discharge hopper or trough 10. This

discharge hopper 10 has one of its sides conforming to the curvature of the inner surface of the tank and secured thereto by fastening bolts 11 as clearly shown in Fig. 2 of the drawings. This discharge trough or hopper 10 is provided adjacent its lower end with an outlet pipe 12 which projects through the said hopper and side of the tank and is adapted to carry pulp from the said hopper to any desired point. It will be obvious that when pulp is carried through the pipe 3 and arms 6 upon revolution of the same by an operation to be hereinafter more fully described, a certain amount of pulp which is discharged through the extremities 7 of the said arms will drop into the hopper or trough 10, and hence be carried from the tank 1 to another receptacle if desired.

Projecting through the lower end of the tank 1 and the apex of the inverted conical shaped bottom of the same is a pipe 13, which has an upturned elbow 15 at its end, and said elbow has a contracted nozzle or outlet at its upper end disposed in alinement with the lower open end 4 of the pipe 3, and spaced therefrom. This pipe 13 is provided with a valve 16 at the outside of the tank 1, and the said pipe is adapted to carry therethrough water under pressure for a purpose to be more fully hereinafter described.

A pair of semi-circular metal strips 17 and 18 are adapted to engage the outer surface of the lower end 4 of the pipe 3, and these semi-circular strips are disposed on opposite sides of the said lower end of the pipe, and have projecting therefrom laterally extending end portions 19 and 20, which are given one-quarter turns at their extremities and contact with each other throughout the length of the same. These laterally extending end portions are secured firmly into engagement with one another by means of locking bolts 21 as clearly shown in Figs. 3 and 4 of the drawings. The extremities of the ends 19 and 20 of the strips have alining apertures 22 therethrough, to which are adapted to be secured one end of chains 23 and 24. When the strips are secured to the lower end of the pipe 3 as above described, and the same is rotated, they will form additional agitating means which are adapted to keep the pulp in the apex of the inverted conical shaped bottom 2 in a constant circulation, and prevent any sediment from forming therein, which would tend to block the open end of the pipe 3.

In operation with the parts of this device assembled as shown in Fig. 1 of the drawings, and it is desired to agitate the pulp or solution contained in the tank 1, the starting pipe 13 which carries the water under pressure, is operated by opening the valve 16 therein, whereby the stream of water under a sufficient head of pressure will be projected in a jet through the outer end of the said pipe and upwardly through the vertical pipe 3 which is disposed in the tank 1. This pipe 3 is revolved by means of the shaft S which carries the pulley P that is connected to some outside motor power. The jet of water which is forced upwardly through the pipe 3 is under sufficient pressure to carry the same to the top of said pipe and will thereby force all the air from the said pipe and also from the radially projecting arms 6 at the top of the same. This will create a suction in the said pipe and arms and will tend to draw the pulp upwardly through the pipe 3, and on account of the revolving of the said pipe and arms, upon the pulp reaching the top of the pipe and passing through the outer upper end of the same into the casing 5, the same will be projected outwardly through the arms 6 by centrifugal force. The pulp will be projected through the extremities 7 of the arms 6 and will hence flow back into the tank 1 thereby causing a complete circulation within the same which will agitate the pulp. After this circulation is started, the valve 16 that controls the water inlet pipe 13 is closed and the flow of water therefrom is stopped and this circulation of pulp within the pipe 1 is kept up by the centrifugal force operating through the arms 6, which tends to throw the pulp outwardly therefrom and will create a constant suction to uplift the pulp through the pipe 3. This said operation through the pipe 3 and arms 6 will be kept up as long as the arms are revolved.

It will be noted that at the lower end 4 of the pipe 3 is fixed an additional agitator which comprises a pair of metal strips 17 and 18 which have projecting ends that carry chains 23 and 24. Upon the revolution of the pipe 3, these chains will be swung outwardly by centrifugal force, and owing to the fact that the same are positioned contiguous to the apex of the inverted conical lower end 2 of the tank 1, a constant additional agitation will be imparted to the pulp in the apex of the bottom of said tank that will prevent any sediment from forming therein and will always maintain an open and free passage through the lower end of the pipe 3. This will prevent the lower end of the suction pipe 3 from becoming choked in any manner which would result in the stoppage of the operation of this agitator. This additional agitating means will also start the pulp in the bottom of the inverted conical bottom of the tank in motion upon the revolution of the pipe 3, before the circulating means are started. It will be noted that the nozzle at the end of the pipe 13 is spaced a short distance from the lower end 4 of the pipe 3 so that the same will be free and unob-

structed, and the additional agitating means will stir the pulp around the said ends of the pipes so that the water will have a comparatively unobstructed passage from one pipe to the other when the same is turned on by the operation of the valve 16.

The trough or hopper 10 which is secured at a point below the arms 6, on the inner wall of the tank, will receive a certain portion of the pulp when the same is discharged from the extremities 7 of the arms 6 upon the revolution of the same. This pulp that flows into the hopper or trough 10 is discharged therefrom through the discharge pipe 12 that is connected to the bottom of the said hopper and the said pipe 12 will carry the pulp to any desired place. This forms an automatic discharge whereby pulp may be taken from the tank 1 during the agitating operation when desired.

This agitating machine forms an easy and simple device for agitating ground ore containing gold, silver, or copper in a cyanid solution or an acid solution for the purpose of extracting values. Upon the starting of the suction circulating means as above described, the pulp in the tank will be kept in a continual circulation, as long as the pipe and arms which are suspended in the said tank are rotated. The additional agitating means that are secured to the lower end of the suction pipe 3, prevent any chance of the circulation of the pulp being stopped owing to the choking of the inlet and of the said pipe. The starting or priming of this device by means of water under pressure affords an easy and simple means for performing said function that is very efficient in operation and one that is very simple to operate. It is merely necessary to turn the valve 16 to allow a certain amount of water into the pipe 3 under pressure and to create a suction, and when the pulp is lifted in the pipe 3 by the said suction, the flow of water is stopped by the closing of the valve 16 at the outside of the tank 1. The circulation of the pulp through this pipe and arms after once being started as above described, will continue as long as the said pipe and arms are rotated within the tank 1, by means of the rotating pulley on the supported shaft S, that holds the arms within the said tank.

From the foregoing description of the construction of my improved agitating machine, the manner of applying the same to use, and the operation thereof will be readily understood and it will be seen that I have provided a simple, inexpensive and efficient means for carrying out the objects of my invention.

I claim as my invention:

1. A pulp agitator comprising a cylindrical pulp containing tank, a vertical suction pipe with a radially projecting arm at its top adapted to discharge the pulp in a predetermined path disposed in said tank, a receptacle secured to the side of said tank and extending a distance in the path of the discharge from said arm, and an outlet for said receptacle.

2. A pulp agitator comprising a cylindrical pulp containing tank having a revoluble vertical suction pipe with a plurality of radially projecting arms on its upper end disposed therein, a hopper having an oval shaped top disposed beneath the path of the extremities of said arms, one side of said hopper conforming to the curvature of the inner wall of said tank and disposed adjacent thereto, fastening means to secure said side to the wall of the tank, the opposite side of said hopper converging inwardly to the first-mentioned side, and an outlet for said hopper extending through the portion of the wall of the tank to which the same is secured.

3. A pulp containing tank having an inverted cone-shaped lower end, a vertically disposed rotatable pipe positioned therein, a pair of semi-circular metal strips engaging the opposite sides of the lower end of said pipe with laterally projecting contacting ends secured together, said ends being given a quarter turn adjacent their extremities, and short length chains secured to the extremities of the ends.

4. A pulp agitator comprising a cylindrical pulp containing tank having an inverted cone-shaped lower end, a vertical suction pipe with a radially projecting arm at its top adapted to discharge the pulp in a predetermined path, a receptacle secured to said tank and extending a distance in the path of said pulp discharge, an outlet for said receptacle, radially projecting arms secured to the lower end of said pipe disposed in the cone-shaped end of the tank, and chains loosely depending from said arms to agitate the pulp adjacent the inlet of the pipe.

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

WILLETT H. BARTON.

Witnesses:
JOSEPH A. BARTON,
GRACE REMIN.