

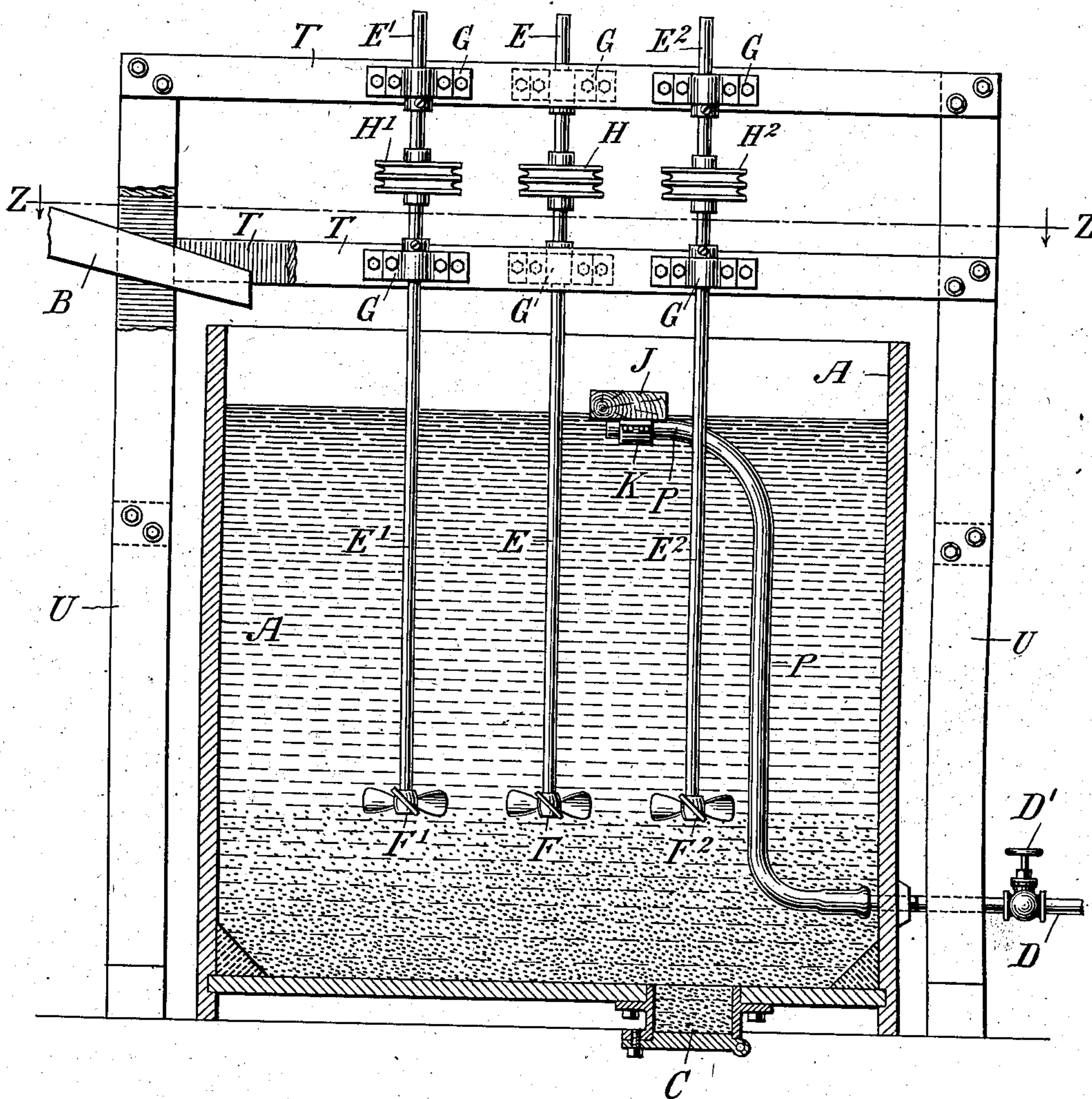
No. 815,272.

PATENTED MAR. 13, 1906.

W. B. DEVEREUX.
AGITATING DEVICE.
APPLICATION FILED MAR. 15, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:
C. E. Ashley
Charles Engel

INVENTOR
Walter B. Devereux
By his Attorney,
Willard Parker Butler

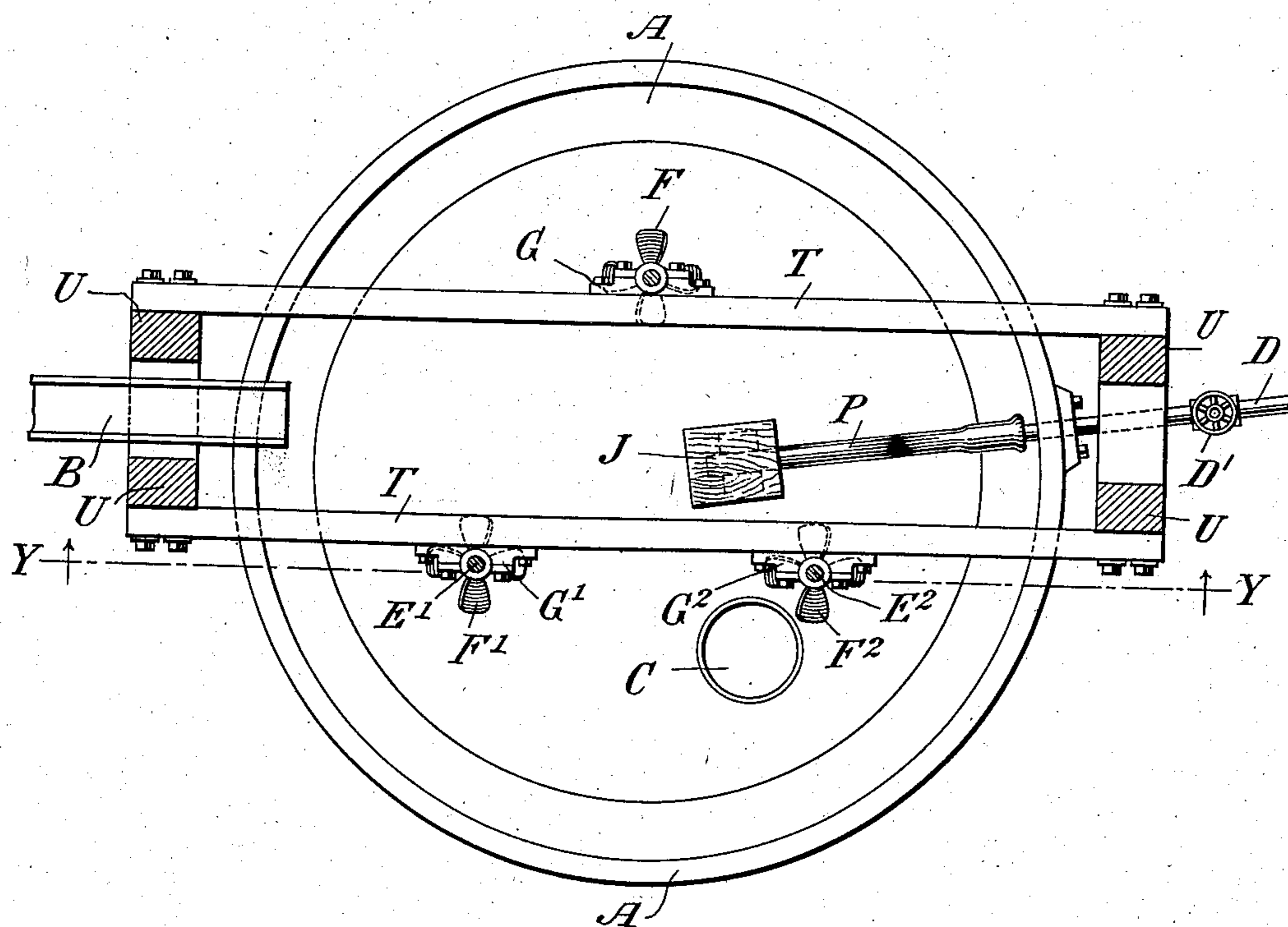
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

WALTER B. DEVEREUX, OF GLENWOOD SPRINGS, COLORADO.

AGITATING DEVICE.

No. 815,272.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed March 15, 1905. Serial No. 250,170.

To all whom it may concern:

Be it known that I, WALTER B. DEVEREUX, a citizen of the United States, and a resident of Glenwood Springs, county of Garfield, State of Colorado, have invented a new and useful Improvement in Agitating Devices, of which the following is a specification.

My invention relates to an improvement in agitating devices which are intended to keep liquids or liquids with solid particles in agitation in processes such as the cyanidation of gold and silver ores, leaching of ores, and other similar metallurgical processes; and the object of my invention is to afford a simple mechanical device requiring a small amount of power for its operation.

In earlier Letters Patent I have described agitating devices which consist of a propeller or a propeller-pump or other mechanical equivalent of the ordinary marine propeller rotating within a tank in which liquids or liquids with solid particles as are to be agitated at such a depth that the solid particles after settling will not interfere with the starting of the propeller, in combination with a series of radial diaphragms placed vertically within the tank, preferably as in such Letters Patent described, so constructed that the liquids or liquids with solid particles contained therein will pass freely through, around, and under them, the purpose of which diaphragm is to prevent rotation of the material in the tank being agitated without subdividing the tank into separate or independent compartments and to cause the propeller, in combination with such diaphragm, to act as a pump which throws the solution downward against the bottom of the tank for the purposes of scouring it. In cases where it is desired to employ larger tanks without unduly increasing the size of the propellers, which would necessarily result from the construction described in the said Letters Patent, I have found that equally efficient and satisfactory results can be produced and the construction still further simplified by replacing the radial diaphragms which are described in the said Letters Patent by a plurality of propellers similar to the single propeller described herein, but of relatively smaller dimensions.

The invention will be best understood by reference to the accompanying two sheets of drawings, forming a part of this specification, in which—

Figure 1 is a vertical section of the appara-

tus employed. Fig. 2 is a plan view of the tank.

Similar letters refer to similar parts throughout both views.

In both of the sheets of drawings, A represents the tank, which may be of any convenient shape.

B represents the inlet-pipe, which is ordinarily a trough, as shown, or in case the tank is closed at the top a pipe provided with suitable cut-off valve. This is placed in any convenient position with respect to the tank and through which the material to be agitated is inserted therein.

C is a manhole in the bottom of the tank through which the final discharge of the tank takes place when the operation is terminated.

D represents the pipe passing through the side of the tank, through which the liquid portion may from time to time be discharged, controlled by the valve D'. The pipe D is connected within the tank to a flexible pipe P, the upper end of which is open and is supported by a float J while the liquid is being drawn off or decanted, which device is technically known as a "floating siphon," and the pipe P is attached to the float J by means of the coupling K shown in the views. Instead of connecting the pipe D with the floating siphon for the purpose of drawing off the liquid portions intermittently the pipe D may be connected with one or more filling devices of suitable form placed at one or more convenient points within the tank.

E, E', and E² represent a series of vertical shafts extending down into the tank, as shown, each of which carries on its lower end a propeller F, F', and F² of the ordinary form used in modern marine practice. These propellers are each turned in such a way as to force the material downward against the bottom of the tank. The shafts rotate in bearings G, attached to a beam T, which passes across the top of the tank. Each shaft carries at its upper extremity between the bearings G a pulley H. These pulleys are so connected by suitable belts or rope drivers that all three of the shafts will rotate at the same time. Any number of shafts and propellers may be employed; but in practice two or three will be found most convenient. The method of driving the shafts and the devices for controlling their movements and reducing the friction thereof form no part of the invention, but may be varied from time to time ac-

5 cording to the purpose for which the device is employed. In practice the size of the propeller will vary according to the size of the tank, and they may all rotate in the same horizontal plane or in different planes, as may be found most convenient.

10 The method of operation is as follows: The material to be agitated is introduced into the tank and the propellers are set in motion. As the tank is not divided into separate compartments, the first effect of the revolution of the propellers is to draw the liquid from above and force it down against the bottom of the tank, where it is deflected radially along the bottom toward the side. The propellers are placed at a point slightly above the point to which the solid material will ultimately settle in order to prevent the same from packing around the propeller-blades, and thereby interfering with the starting of the same. The rotation of the propellers produces an intense scouring action which in a short time lifts the solid particles from the bottom of the tank and forms a homogeneous mixture of liquid and solid material through every part of the tank, which condition continues as long as the propellers are kept in operation. After the material has been agitated a sufficient time the propellers are stopped, and the clear

30 solution can then be drawn off from the top through the floating siphon as soon as the solid material has settled sufficiently to leave a layer of clear liquid at the top.

I claim as my invention—

1. The combination in a metallurgical apparatus, of a tank and a plurality of propellers arranged to rotate on vertical shafts a substantial distance above the bottom thereof and above the level to which the solid material of the charge will settle when the propellers are at rest. 35 40

2. The combination in a metallurgical apparatus, of a tank; means for decanting the liquid contents thereof; and a plurality of propellers each arranged to rotate on a vertical shaft within the tank a substantial distance above the bottom thereof and above the level to which the solid material of the charge will settle when the propeller is at rest. 45 50

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 14th day of March, 1905.

WALTER B. DEVEREUX.

Witnesses:

FRANK LYMAN,
A. M. Gow.