N is a casting which acts as a base to the cone, and is provided with a hole in its centre which keeps pipe B in position.

Fig. 2 shows a tank with a steel-plate stand. This makes the tank self-contained, and renders its erection very simple, as the four sections can be bolted together and upended on a level concrete floor, the casting N taking its share of the weight.

Fig. 5 is the cone in section of a 15 ft.-diameter tank, and Fig. 6 is the same cone in plan. These show a different arrangement of distributing-pipes, there being two circles of pipes branching from the same upper casting; this is necessary owing to the cone being deeper when it is required to treat sand or coarse battery pulp.

When a number of tanks is to be installed it is advisable to have supply-pipes F and H at the top of the tanks and arranged like pipe B. They can be connected to a common supply-pipe running parallel to the row of tanks. A branch from this supply-pipe can be connected to the main air-supply pipe in such a manner that either solution or air can be supplied. This arrangement is very convenient, as all the valves can be operated from a platform at the top of the tanks, say, about 3 ft. down from the top, and running between two rows of tanks.

When it is only desired to treat slimes or very finely ground pulp containing a large percentage of slimes, one circular casting G with jets G′ is sufficient, but it should be arranged so that the jet G′ impinge against the side of the cone at a point about one-third of the distance from the bottom—*i.e.*, somewhat lower than shown in Fig. 1.

When the treatment calls for filtering to recover the gold-bearing solutions, the decanting-pipe K is not required, as the discharge is through the opening J, to which a suitable hose can be attached. By having the hose attached to a fixed supply-pipe to the filters, it can be made to serve a number of tanks, as it can be coupled and uncoupled to J as required.

Method of operating the Tanks.—The crushed ore from the battery, or the "slimes," is introduced into the tank at the top by a launder, or by a pipe from the sludge-pump. If it is desired to treat the material without decantation, the tank is filled to within 1 ft. of the top, and the agitation started and continued as long as necessary, and the treated material is then discharged to the filters through opening J. During the operations of filling and emptying it is advisable to have air issuing from the jets G′ to prevent settlement of the material on the cone. If it is desired to use decantation, the charge is allowed to settle after the tank has been filled, and the clear water or solution is decanted off through pipe K. Cyanide-solution is then introduced through pipe F, supplying casting E, which discharges through pipes E′, E′, &c. The solution finds its way upwards through the body of the ore, and softens the ore around pipe A. When the solution has risen to within 7 ft. or 8 ft. of the top of the pipe A, air is turned on through pipe B, which discharges through valve C. This causes an upward flow of the material through pipe A. When the material has risen to within 2 ft. or 3 ft. of the top of pipe A, the solution is turned from pipe F to pipe H, supplying casting G, which discharges through the eight jets G′, G′. This undermines any material left remaining on the side of the cone, and the whole charge soon becomes a homogeneous mixture of ore and solution.

The solution is shut off as soon as the tank is full, and the quantity of air issuing from pipe B is reduced to the amount required for a suitable circulation.

When the dissolving of the gold and silver is complete, the air is shut off and the charge allowed to settle. The clear solution is then decanted off, and as many nashes added, agitated, and decanted off as may be required.

Correct samples can be taken at any time during agitation by means of the simple device here given: A is a short piece of 2 in. pipe, about 18 in. in length, one end, B, being reduced to ½ in. The other end, C, is plugged with an iron or wood plug fitted with a small removable plug D. A cord is fastened to pipe A in such a manner that it has a vertical position with the end B uppermost. The pipe A is lowered into the circulating charge at a speed so regulated that by the time it has reached the bottom of the tank and been pulled up again it has become three-quarters filled with the mixture. The pipe is now well shaken to thoroughly mix the material in it, and by withdrawing the small plug D the contents can be readily emptied into a bucket or other suitable vessel. Two or three of these dips with the apparatus will make a good sample.

After the final wash has been decanted off, water is pumped in in the same manner as a wash, the air turned on, and the charge agitated. It is then sampled, and the discharge-cock at J opened, and the whole charge will run out in a short time without any further trouble.

In treating ore a large percentage of which will settle readily, a considerable saving of time can be effected by not waiting for the solution to settle clear, but decanting it down to the solid sand, and passing the dirty solution through a suitable filtering apparatus. In some cases it is advisable to filter-press the whole charge, and not make use of natural settlement.

A Paper on Barry's Honeycomb Tube-mill Linings, by Mr. H. P. Barry, M.Inst.M.M., Superintendent Waihi Gold-mining Company (Limited).

The introduction of the tube mill has assisted considerably in not only increasing the output of stamp mills, but has been the means of producing a much better and finer product. In cyanide practice I find that where tube mills are used to reduce the size of the ore particles, which have already passed through a coarse mesh, not only is the extraction higher, but the duty per stamp is considerably increased.