This method of admission was found to be easier and more effective, and to give better results, than the plan of admitting the solution under the filter bottom. The spent sands are removed by being sluiced out through the centre discharge door—an operation which requires about three or four hours. We employ a hose with a 1-inch nozzle, under an effective head of about 200 feet.

The gold tanks are two in number, 10 ft. in diameter and 6 ft. in height, fitted with heads and connected with the vacuum pump. In practice we seldom use this connection, except at the end of the leaching process, as the pump has a tendency to cause the sands to pack in the leaching-vats and to interfere with percolation.

From the gold tanks the solution is run to the zinc-boxes, which are arranged in two series of twelve each. Each is a square movable iron box, with a capacity of one cubic foot of zinc shavings ; and each is independent of the other boxes. Below the zinc-boxes are two sump-tanks 12 feet in diameter and 6 feet in height.
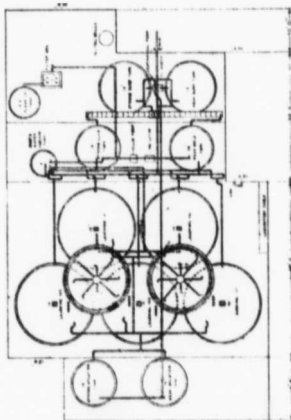

FIG. 1.

The solutions from either series of zinc-boxes can be drained into either sump, independently of the other, or can be drained to waste. Above the sumps is placed the centrifugal pump which forces the solution back to the solution-tanks—two in number, 10 feet in diameter and 6 feet high. The solution can be pumped from either sump-tank to either solution-tank.

The solution is made up to the required strength in the strong tank by placing the requisite quantity of cyanide in an iron basket, having sides of wire netting, and lowering the basket into the solution. The cyanide is entirely dissolved in this manner in about one hour. We quickly abandoned the plan of making up a large amount of strong solution in a stock-tank, as we found that the loss by decomposition was heavy.

The work done in the plant has been of two kinds : (1) The treatment of tailings direct from the mill (from February 18th to May 10th) ; and (2) the treatment of accumulated tailings (from May 10th to July 30th). The first group will be hereinafter referred to as "mill-tailings," and the second as "dam-tailings." Both groups were from the same mill and the same class of ore.

During the first period 841 tons of mill-tailings, and during the second period 1582.4 tons of dam-tailings, were treated, making a total of 2423.4 tons. At the end of the second period the entire contents of the zinc-

boxes were cleaned up. The tonnage was estimated, by considering 23 cubic feet of settled sands to be equal to one ton. This figure was first arrived at after careful measurements, but we realised that it was only approximate. The actual value of bullion recovered was $17,179.77, while the amount which should have been discovered (estimating the tonnage as above, and the recovery as the difference in the assay value of the tailings before and after treatment) is $20,085.74. In considering this discrepancy, it must be remembered that, at the commencement, the plant was quite new, and some time elapsed before the plant was running smoothly, leaks were stopped, and the various stages of the work were brought up to an efficient condition.

The average value of the mill-tailings was, before treatment, $5.28, and after treatment, $1.34 per ton—a recovery of 75 per cent. The average value of the dam-
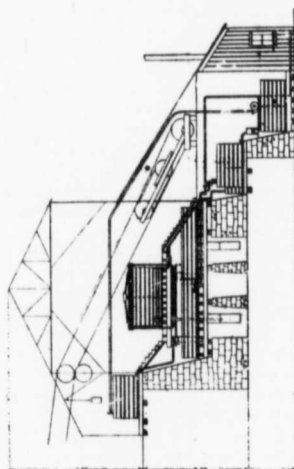

FIG. 2.

tailings was, before treatment, $10.80, and after treatment $2.17 per ton—a recovery of 80 per cent.

In considering the percentage of recovery in the case of the mill-tailings, the question of the conditions under which these tailings were deposited becomes very important. Before the filters were introduced into the settling-tanks, the value of the tailings was $6.00 per ton before treatment and $1.74 after treatment, or a recovery of 71 per cent. After the filters were introduced, the value of the tailings before treatment was $4.20, and after treatment 54 cents per ton, giving a recovery of 87 per cent. The figures are averages ; but to emphasise this point further, I herewith give the assays of the last seven charges of mill-tailings treated at a time when the plant was running smoothly.

Lot.	Before Treatment. Per ton.	After Treatment. Per ton.
21	$6.20	$0.21
22	3.10	0.42
23	2.48	0.21
24	1.65	0.21
25	2.27	0.21
26	3.51	0.21
27	4.96	0 21

This exhibit shows that under this system, we were able to extract practically all the gold values, even from tailings containing fairly high values at the start. I attribute this satisfactory improvement principally to