consists of a launder with boxes on the side opening into the main launder and having rising currents of water of varying intensity in them. The heaviest particles naturally settle out in the upper boxes and a separation according to the heaviness of the pieces is thus made. The feed thus classified and the different portions led to suitable fine jigs below the overflow passes on to the round table tank. The particulars of these jigs are given in the tabulated statement and need not be described here. The concentrates from these jigs are led to the ore-bin below. The middlings from these fine jigs are run to an unwatering box on the lower floor in front of No. 2 elevator. The settled material in the box is run into the elevator through a gate at the bottom of the box. The over flow passes to a long tank from the bottom of which the settled material is tapped by spiggots and this is also run into the elevator. The overflow of the tank passes to the main settling tank of the mill. The elevator takes the middlings up to the roll floor, where they are run into an inclined launder behind the pair of fine rolls to which it is fed by gates.

These rolls are Allis wet rolls 30 in. in diameter and 14 in. width of face and run at the rate of SS R.P.M. The feed is divided equally between the rolls from which it passes into a small trommel. This trommel is  $\mathcal{E}$  ft. long, 36 in. in diameter, has a mesh of 3 m.m., and guns at the rate of 20 R.P.M The oversize of this trommel passes into a small elevator which raises it to the roll floor again and passes it into the third pair of fine rolls. These are 24 by 14 in. rolls and run at the rate of 52 R.P.M. From these rolls the recrushed product passes again into the middling trommel. The feed passing through the mesh of this trommel is equally divided between two similar Calumet classifiers exactly similar and parallel to that on the direct feed side In the fine jig room, and also in the vanner room, the recrushed middlings are treated, one, the left hand side, (travelling with the feed) and the direct feed on the right, an equal number of machines being provided for each.

The middling jigs are exactly similar in construction to the direct feed ones, but in practice no tailings are made unless the feed is very heavy, overflow water only being allowed to go into the tail race. This it will be seen throws a very heavy zinc feed on the middling vanners.

The middlings from these jigs are piped down to an unwatering box in front of No. 2 elevator and are elevated and recrushed. The concentrates of course pass to the ore bin below.

Bedding is used on all the fine jigs. It collects gradually itself on the direct feed side and is skimmed off and taken over to the middling jigs with a shovel. This has to be attended to frequently. The size of the bedding is shown in the samples.

The fine jig room contains in all eight sets of jigs, four on the direct feed side and four on the middling feed side. They comprise what is known as the fine mill and are run by a separate Pelton water wheel.

The overflow from the three Calumet Classifiers passes over screens through which it falls into a tank above and behind the round table. This tank is 54 feet long and of a cross section as shown in the diagram submitted. The side of the tank near the bottom is pierced with a number of holes filled with big spigots which again have small holes in them plugged with small plugs about  $\frac{1}{2}$  inch in diameter. There are about ten of these holes behind each table. Half of these feed three at a time on the top table and the other five feed a similar tank below which in turn feeds the second row of tables There are three tiers of tables, three in each tier, the middlings from the upper two comprising the feed of the lower table. The tables are 18 feet in diameter and have a speed of one revolution in 75 seconds. The concentrates from all three tables go direct to the slime concentrate bin while the tailings go direct to the tail race. The middlings from the lower table run down and into an elevator (No.  $_4$ ) by which they are elevated to a settling tank behind the middling vanners. Samples of the round table concentrates, middlings and tailings are shown in bottles 22, 23 and 24.

The overflow from the round table tank runs into a long tank behind the direct feed vanners.

The feed, by a system of launders especially on the middlings side is made fairly uniform.

The upper Vanner Room contains ten vanners, five on the direct side and five on the middling side. They are the ordinary 6 ft. Frue vanners and run at from 205 to 210 R.P.M. The feed is from spigots in the bottom of the settling tank, there being five spigots about  $t_4$ inch in diameter opening into a launder snpplying each vanner. Two of these are kept running, the plugs behind the vanners being changed every half hour. This insures a more uniform feed and also places the feed on the vanners much thicker. There are two very good devices which are not met with on all Frue vanners. One consists of a small extra roller held tightly against the out side of the belt just below and behind the large front roller as shown in the diagram. This cleans the belt very thoroughly and causes all the concentrates to fall into the box doing away with the heavy hoeing which is one of the hardest parts of a vannerman's work. The other device consists of a hole in the bottom of the concentrate box connected by a short pipe with a launder running into the slime concentrate bin.

A constant stream of water is fed into the concentrate box and this washes the concentrate into the launcer and so carries it to the slime concentrate bin where it settles, thus doing away with all shovelling and transporting of the concentrate. The overflow from the vanner tank passes into a long covered tank outside the mill where the settled material is again drawn off by spigots and this feeds into the settling tank behind the lower vanners. The overflow from this last settling tank outside the mill passes to the tail race. The tailing's of the upper vanner which runs about 2 per cent. lead run down to the settling tank behind the lower vanners.

In the lower vanner room there are four 6 feet and one 4 feet Frue Vanners. The feed from the outside overflow tank feeds in at the end and the tailings from the upper vanners feed in a different point along the tank and are therefore principally handled by some separate vanner.

The overflow from the feed tank runs into the tailing launder and helps to flush it out. The lower vanner concentrates are wheeled out by wheel-barrow and dumped in a pile preparatory to loading. The tailings which are expected to be kept 1½ per cent. go direct to the river.

Samples of vanner concentrates which should be between 50 and 60 per cent. lead, and of the direct and middling tailings are shown in bottles 25, 26 and 27.

The slime mill is run by a separate turbine and the speed of the vanners may be varied to suit the feed. Although the tables are also run with this turbine, the speed is *zltogether* regulated to suit the vanners. The speed varies between 200 and 210 R.P.M., the speed depending in the percentage of zinc, a very heavy zinc load necessitating a high speed.

The concentrates from the mill are run into bins and allowed to settle, the overflow water passing into the mill settling tank. There are two ore bins and two slime concentrate bins, the feed being turned into one of each pair while the other is being cleaned out. The ore is wheeled out, weighed, run and dumped into freight cars in which it is transported to the smelter.

The mill is exceptional in not having the fine jig middlings ground