

description of the battery I consider superfluous, similar constructions having been described in previous mining reports, so that I may pass over to an explanation of the dressing plant.

“The mixture of sand and mineral discharged from the stamper-boxes through woven steel-wire screens passes over tables covered with amalgamated muntz-metal for saving the free gold; it is then supplemented with a further quantity of water, necessary for the proper classification into slimes and coarse parts, which takes place in the classifiers, of which each two forms one system in connection with each five head of stamps. The classifiers, invented by Von Rittinger, are pyramidal boxes. Their action is based on the principle that a material composed of particles of different size and density may be separated by a rising stream of water into different fractions of certain size and character each. The velocity of the water-stream may be so regulated that particles of a certain size and character sink and may be conveyed off, while the remainder is carried upwards by it. By such procedure, and by repeating this operation a number of times with a gradually-decreasing velocity of the rising stream in each instance, the material can be separated into as many classes of grain as desirable. For the treatment of the Sylvia ores, two boxes, one following the other, are sufficient. The discharge of the first consists in coarse quartz and mineral, the discharge of the second in fine quartz and mineral, and the overflow of the second contains the whole of the slimes. The two qualities of classifier-material, coarse and fine sand, are discharged through pipes into separate jiggers, which are used to separate the mineral from the quartz, or, in other words, to concentrate the sand. The jiggers are wooden boxes, divided into two compartments, which are in communication with each other and filled with water. In one compartment a plunger moves up and down with short and energetic strokes; the other compartment carries a fixed horizontal sieve, covered with a bedding of very heavy mineral broken up into small particles, which are lifted up and fall back in quick succession in consequence of the jiggling motion of the water produced by the action of the plunger. A mixture of sand and mineral passing over such false bottom in action will be separated into two fractions: the mineral, which, being of higher specific gravity, works its way through the false bottom into the box below; and into sand, or tailings, which are carried away by the continuous stream of water that passes through the machine. Two sieves, with the corresponding plungers, are united in one box constructed in such manner that the tailings coming from the first sieve pass over the second one, undergoing thus a second treatment before going into the buddle. Two jigger-sieves have been found sufficient to treat efficiently the material coming from one classifier. Four double-jiggers treat the whole material crushed by ten head of stamps. The concentrates from the jiggers are only in exceptional cases clean enough to make a further cleaning-operation superfluous. They contain, as a rule, a certain percentage of quartz, which has passed through the false bottom with the mineral, and which has afterwards to be separated. The finishing-off operation takes place in two jiggers of identical construction to those previously described, which are called dressing-jiggers. The products of each classifier, the coarse and fine sand, are treated by themselves in a special set of jiggers, it being one of the principles of the concentrating system that different classes of ore, once separated, are kept strictly separate through the various operations, as otherwise various qualities and sizes would after their previous separation be united again, to the great disadvantage of the process as a whole.

“The principal points to be considered for obtaining satisfactory results with the jiggers are the false bottom, the sieve, and the speed. The specific gravity of the material forming the bedding on the sieves must be higher than that of the heaviest material to be saved, and must be broken up into particles adapted to the size of the crushed ore. The thickness of the bottom is also of importance: the layer has to be kept thin for rich ore and thicker for poorer. The proportion of the thickness of the material on the first and second sieve should be two to one; the mesh of the sieve must be selected in accordance with the screen of the battery. The third point of importance in connection with the jiggers is the speed, which for the treatment of the Sylvia ores has been found best at 200 strokes for first and 250 strokes for second jigger. The overflow of the classifying-boxes contains the whole of the slimes—viz., very finely-divided quartz, very finely-divided mineral, and eventually bullion—and is conveyed through wooden launders into large settling-tanks divided in pyramidal compartments, and from each compartment the settled slimes are discharged through a narrow pipe on to a revolving-table, which separates the mineral from the sand. Such revolving-tables are 12ft. in diameter and of a conical wooden construction. Two tables are built, one above the other, on one vertical iron shaft; but each works independently from the other. They are called catch-tables, in opposition to the dressing-tables, which I shall describe later on. The tables are built of kauri and totara timber. They complete one revolution in two and a half minutes. The slimes are discharged through an iron collar launder upon one side of the table, near the centre, from where they spread over the conical surface, and are met by a supply of clean water discharged into another partition of the same launder, which washes the fine sand to the periphery of the tables, whereas the mineral contained in the slimes remains on the table until it reaches on its revolving journey the place where the first revolution is completed and where four jets discharge water under high pressure at an angle of 45°, whereby the whole material still remaining on the table is removed, and discharged into wooden tanks situated underneath the table. The fine particles of sand which leave the table at the periphery by means of sheet-iron launders are discharged into a settling-tank of small dimensions, from which the heavier part is fed into a buddle, with the object of saving the small fraction of a per cent. of the mineral which may have left the table with the tailings. Such slime-concentrates are not yet quite clean, but contain some sand: they undergo therefore a second treatment of a similar character on dressing-tables, which are a combination of three tables on one shaft, forming one system together. The slime-concentrates obtained from the catch-tables are discharged with water (by means of a pump) on the top table, where they undergo the same treatment with water as described before, but with the difference that the second story receives the concentrates for a