

When the tin is collected from the sluice-box it is put in bags and taken to the refining and smelting works at Tent Hill, about three miles from Emmaville, which belong to the Glen Smelting Company. This company is likewise working a tin lode on the same principle as that of working a quartz-reef containing gold. The stone is taken from the mine and crushed in a stamping-battery, the same as crushing quartz. Afterwards the crushed material goes through a process of jigging and concentrating to separate the sand from the ore. Through the courtesy of Mr. John Reid, the manager and part proprietor, I had every information as to the different modes of treatment fitting the ore for market. A description of these works is as follows: The crushing-battery consists of ten heads of stamps, about 6cwt. each, making 70 blows per minute, to which is attached jigging and concentrating buddles of the most modern design. The tin ore is brought from the company's own mine, as well as from the various mines in the district, and deposited on an elevated floor in front of the battery, from which it is hand-fed, into the stamping-box, and crushed in the ordinary manner, a stream of water continually flowing into the stamp-box on the same principle as the water supply for a quartz-battery. The ore is crushed and discharged through gratings varying, according to its nature, from 64 to 144 holes to the square inch, into a shoot from 4ft. to 5ft. long, that carries the ore and sand into a V-shaped separator or classifier, which is constructed with an inverted Δ to contract the current in such a way as to cause the whole of the crushed material to reach the lower point of the box, where an upward current of water, with regulated pressure, meets the downward stream, thus forcing upwards and onwards the lighter particles of ore and sand, leaving the heavier particles, as well as those of a uniform specific gravity, to descend into a pipe that has a lower outlet than that where the sand and light particles of ore are discharged, thus collecting the crushed ore that has grains of a uniform density; and as the grains of sand are generally much coarser than those of tin, the work of separation becomes in a great degree modified. The coarse material is conveyed by a pipe from the separator or classifier into aprons, which are connected with a pair of double-jiggers. These consist of a large box divided into four compartments, the outer compartments being for the sieves or screens, which are a little coarser in the mesh than the gratings in the stamp-box. Upon these sieves are placed a layer or bedding of ore $2\frac{1}{2}$ in. in thickness, having such a degree of coarseness as to prevent it passing through the sieves. The inner compartments are for pistons or plungers working in. The downward motion of the pistons are given by means of a rocker, which is connected with a crank, and the upward motion by means of a strong steel spring attached to the piston-rod or shank. Each piston-box is connected with the compartment in which the screens are placed, and the box being filled with water, which is kept continually flowing in, the downward motion of the pistons causes the bedding on the sieves to lift up, and the upward motion draws in such grains of ore as will pass through the sieves, which, by proper adjustment, produces clean ore from the first set of jiggers. The waste material is then run into a second pair of jiggers, and undergoes a similar treatment, only that as the desire is rather to exhaust the tin ore from the gangue, a considerable portion of the latter is drawn through with the ore, and therefore this product has to undergo another treatment, which, in this case, is done on what is known as the Rittinger shaking-table. The stuff enters these inclined tables (which are about 9ft. in length) on one corner, and the water being continually flowing over the whole table, the shaking motion, which is in a rectangular direction to the incline, throws the down-running stuff into the current of water. The heaviest parts advance most, and, when the stuff arrives at the lower edge of each table, the current is divided, and the stuff runs into different receivers. The action of the tables can be regulated, according to the stuff under treatment, by means of altering the incline, the quantity of water, and also by the length and form of the rectangular motion, which is adjusted by steel springs. These tables work automatically, and thus save manual labour.

The stuff passing from the upper outlet of the first classifier passes into a second, and then undergoes similar treatment, the coarse grains passing over a Humboldt jigger, which is similar in principle to the other jiggers. The enriched product from the Humboldt jigger is in turn conveyed to Rittinger shaking-tables, and there undergoes further treatment. What is known as "slimes" is conveyed over a series of V-shaped settling-boxes, from the bottoms of which the thickened material is carried by a launder and deposited in a large receiver having an outlet at the bottom, through which the heavier particles flow into a rotating-table, which is about 12ft. in diameter, having a convex surface, so that all the stuff passes down from the centre towards the outer edge. This table revolves slowly, and is supplied with jets of water at different parts, so as to insure efficient concentration. The material, which is fine sediment, is carefully fed into the tables, and by the addition of clean water the lighter particles are washed off and become waste, while the product remains until washed off into a receiver and sent back to be treated by the Rittinger shaking-table.

The dirty water, flowing onwards from the separators or classifiers, passes over a self-acting table; and here any minute particles that may have remained in suspension are deposited, which, at even intervals, are washed down by a tank of water working automatically, and the water returns to the dam in a fairly clarified condition.

The tailings are deposited in a very careful way, so that, if any ore should miss the several machines, it can be collected and sent back for further treatment; but the machinery is now perfected to such an extent that very little stuff has ever to be handled twice. The tailings are run over convex buddles having about 7ft. of an inclined plane, and afterwards into pits, from which they are lifted into trucks and run away into a gully below the dam, where the surplus water in flood time washes them away. A few weeks before visiting these works about 1,500 tons of tailings were carefully ground-sluiced; but the quantity of ore found was very small, and could only be recovered by a finer reduction of the gangue.

One buddle is kept for general use, as is also a straining-box, over which all the ore passes before being sent to the furnace. Water is elevated by means of a 4-in. centrifugal pump, and the whole of the plant mentioned, together with a brick-making machine and charcoal-grinder, is driven by one of Marshall and Son's 16-horse power double-cylinder portable engines. From 50 to 60 tons of ore is passed through the battery weekly, yielding in black tin from 5 to 10 per cent.