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## THE ORE-DRESSING MACHINERY AT THE NEW TASMANIAN SILVER-MINE, ZEEHAN.

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This machinery, being the first of its kind used in Tasmania for treating silver-ores, has attracted unusual attention from engineers and others connected with the Tasmanian silver industry, and the following short and necessarily superficial description of it will probably meet the requirements of those who desire a general idea of the system adopted, and will form a basis for those who contemplate erecting similar machinery.

The ore is first fed into an ordinary stone-breaker (A., Plate 1), which breaks it into pieces varying in size from one cubic inch downward. It then falls upon an inclined shaking-table (B., Plate 1), the upper end of which is perforated for the purpose of allowing all the ore which may already be reduced sufficiently in size to pass through the perforations, and from thence into the jiggers.

The coarser pieces of ore are delivered by the shaking-table into a pair of crushing-rolls (C., Plate 1). These complete the crushing and reduce the ore to the size suitable for treatment in the jiggers.

In practice it is found that a small proportion of the ore gets through the rolls before being reduced to the required size. This is prevented from going to the jiggers by means of a revolving cylindrical iron sieve known as a sizing-trommel (D., Plate 1), which receives all the ore discharged from the crushing-rolls, that which passes through the trommel being fine enough for subsequent treatment in the jiggers, and is carried automatically to the jigger-house, while that which passes *over* the trommel is taken back to the rolls by a self-acting elevator and is recrushed. The ore is now ready for treatment in the jiggers. There are five of these, each divided into six compartments. A sheet of perforated iron is fixed in compartments 1, 2, and 3, and upon this is laid a bedding of clean galena about one inch thick and made up of fragments just too large to pass through the perforations.

A stream of water constantly flows in at one end of the jigger and out at the other, thus keeping up a continuous horizontal movement, and a jiggling (rising and falling) motion is imparted to the water by means of plungers placed in compartments 1A, 2A, and 3A.

The ore, which has previously been sized in a trommel or a classifier, is now fed in at compartment 1 and drops into the agitated water. The best of the ore being heaviest falls to the bedding, intermingles with it, and finally passes through the perforated iron plate and is discharged as clean ore through the bottom of the jigger. The lighter part, consisting of easily separated gangue, is carried by the current of water to the tailing-box; while the medium weight stuff, which consists of a mixture of galena, zinc blende, and iron pyrites, is arrested in compartment No. 2, in which the jiggling motion of the water is more gentle and the bedding a little thicker. Here the galena is separated from the blende and pyrites, the former passing through the bedding and the perforated iron, whilst the foreign matter is carried to compartment No. 3, where it is similarly treated and deprived of any galena which may still be mixed with it.

It is lastly washed off as tailings, and by the time it has passed through the three compartments it carries only a minute proportion of galena.

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If it is desired to save the blende and pyrites as by-products, the stroke of the plungers can be so arranged as to save clean galena in compartment No. 1, a mixture of galena, blende, and pyrites in No. 2, and blende and pyrites in No. 3; but the writer does not advocate this style of machinery for effecting a clean separation of blende from pyrites. Each jigger completes its own work, and acts independently of the others. The operations carried on in each are similar, the coarsest stuff being treated in the first jigger, and each one in succession being fed with finer stuff than the one before.

To get a maximum amount of work out of the jiggers it is essential to feed them regularly and with as near an uniform size as possible. To effect this the coarser stuff is sized by trommels, and the finer by conical classifiers.

A trommel is simply a cylindrical sieve and requires no description. A classifier is a vessel like a large funnel; an upward jet of clean water is introduced at the bottom of the classifier, whilst water containing fine ore in suspension flows in at the top. The heavier part of the ore resists the upward current and falls near the bottom of the classifier, where there is a place for its exit, while the lighter and finer stuff passes forward to the next classifier, which is larger, and in which the upward current is less strong.

Three of such classifiers separate all the fine ore from the slimes; the former is treated in the jiggers, and the slime is dressed in the ordinary well-known cradle.

The capacity of this plant varies with the class of ore under treatment. The ore from one part of the New Tasmanian Silver Mine, in which the gangue is silica, can be treated at the rate of 20 tons in eight hours, while that from another part of the mine, in which the gangue is composed mainly of blende and pyrites, requires nearly double the time.

The power for driving the machinery is furnished by a 10-inch horizontal engine, and the steam-pressure used is 60 lbs. per square inch.

The whole of the machinery was made and supplied by Mr. Geo. Green, of Aberystwith, North Wales, who makes a speciality of ore-dressing machinery, and who has for many years enjoyed a high reputation for his success in this important branch of engineering work.

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