Stamper Battery Building

This building was constructed in 1980 on similar lines to the original building i.e. rounded timber poles supporting sawn timber rails, and rafters for roofing and walls. The most used materials for roofing and sheeting of the walls in the mining days of Gympie and other mining towns was galvanised corrugated iron, together with smaller amounts of timber weatherboards. This building houses the only remaining mining machinery on its original site on the Gympie Goldfield i.e. a ten-head crushing stamper battery. As can be seen by the concrete foundations, the original battery building on this mine, No. 2 South Great Eastern, housed 80 head of stampers, or eight sets of ten-head stamper batteries, which were built by a Foundry at Bundaberg, Queensland, around about the 1900's.

The building also housed a line of shafting (probably about 12.7cm (5 inches) diameter) from which each ten-head stamper battery was driven by a 25.4 cm (10 inch) flat belt. The line of concrete pedestals carrying this line of shafting can be seen on the eastern side of the present building. Two of these are still protruding through the concrete floor of the dairy display under the old school building. The steam engine and boiler used to drive this line of shafting was situated between the present museum building (old water reservoir) and the present school building (these can be seen on old photographs).

Also housed in this building were the timber tables below the batteries on which copper plates were attached where the gold was collected by an amalgamation process with mercury. A ten-head stamper battery is made up of two sets of five stampers. Each stamper is made up of a steel shank or shaft, a tappet (which is adjustable for various amount of fall), a steel or cast iron head, and a heavy cast iron shoe for crushing. (Approximate weight of each stamper in this particular machine with new shoe attached is 450kg or 1000lbs). Each stamper is lifted by means of a cam attached to a 15.24cm (6 inch) shaft that is driven by a wooden pulley from the counter shaft as mentioned. Steel and cast iron pulleys were used to drive batteries, but due to excessive vibration it was soon discovered that the wooden pulley far out-performed the steel or cast iron pulley, as these in no time would break up. The lifting cams are arranged to drop the stampers in a pre-arranged sequence to distribute the feed ore across the dies. The lower part of the shank, the head and the show, move up and down in the mortar box where the crushing of the ore takes place between the shoe attached to the head on the shank and heavy dies placed in the bottom of the mortar box. The cast iron mortar box is lined with steel liners that can be replaced together with the shoes and dies as they wear out.

The gold-bearing ore is fed into the mortar box through an opening at the rear of the box. Water is added through two openings on top of the mortar box, and to the front lower part of the mortar box a heavy wire screen is fitted to an opening to which the ore is required to be crushed to release the particles of gold.

Each stamper drops at approximately 100 drops per minute, when the ore is crushed to sufficient fineness it is washed through the wire screen and is washed down over the amalgamating plates where the gold is recovered.

Periodically, each five-head of stampers are held up above the revolving cams, where clean water is allowed to pass through the box and wash all the crushed ore off the amalgamating plates. The water is then turned off and the gold amalgam is rubbed off the plates and collected in an amalgam bucket ready for further refining. Before restarting the crusher more mercury is added and spread over the amalgamating plates.

As any coarse gold in the ore cannot be crushed to pass through the wire screen on the mortar box, small amounts of mercury are regularly added to the mortar box to amalgamate the coarser gold which can then be collected from within the mortar box from time to time.

This building also houses a two-head prospecting battery built by a local engineer, Mr Jack Rummutt. He built several of these small batteries and other milling equipment that were used in the Gympie district and outside areas. The battery is driven by an early model Crosley kerosene engine and can be seen working on different days throughout the year.

Alongside this prospecting battery is a 30cm (12 inch) deep-well pump used by Local Authority to supply the reticulated water to the town of Gympie for many years. Originally, this pump was driven by a triple expansion steam engine, later by an I.C. diesel engine and, sometime before being replaced, by an electric motor that can be now seen attached to the head of the machine.

Also housed in this building is a locally manufactured gold-recovery machine, bullock wagon and various horse-drawn vehicles, including a tip-dray, as used in mining days.

The Stamper Battery Model

This is a 1/6 scale-working model of the stamper battery still in its original position in the top section of this museum.

The stamper battery together with the amalgamating tables over which the crushed ore is discharged forms a complete treatment plant for the extraction of gold from its ore. No other machine effects the reduction of ores so well as gravity stamps. The action is the same in principle as that of the pestle and mortar used by early chemists and also that used by the prospector with his 'dolly pot'.

The revolving camshaft lifts each stamper, weighing between 454 – 544kg (1000 – 1200lbs) approximately 150 – 175mm (6 –7ins) at the rate of 90 – 100 drops per minute. The stamper falls under gravity with the turning motion imparted by the lifting cam crushing and grinding the ore, maximum feed size 100mm (4ins), between the fixed but renewable die in the bottom of the mortar box and the renewable shoe on the head of the stamper stem. The crushing capacity, reducing 100mm (4ins) quartz to sand in approximately 1 tonne per hour per 5 head using approximately 11.190kw (15hp) per 10 head.

The water fed in at the top of the mortar box carries the crushed ore through the screen and on to the amalgamating tables. The drop on the tables is set to suit the ore being crushed and the amount of water used, so that the water and ore mixture runs down the table with a tumbling wave motion, thus bringing the ore into contact the amalgamated copper plate. Mercury, having a much higher affinity for gold than copper, then forms a gold amalgam that remains on the plates or is picked up in the troughs below the plates. The plates are cleaned regularly and the resulting gold amalgam is retorted, leaving fairly clean gold in the retort with the mercury driven off by the heat being condensed and re-used. This gold is then smelted and poured into ingots, thus forming gold bars that can readily be assayed for gold content and sold as such.

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