



Figure 8. Early stamp mill of the type probably used for crushing gold ore at the St. Catherine Mill (Illustration from Hutchings' California Magazine, 1857)

After being crushed, the material would roll down a succession of both coarse and fine sieves. The part rejected by the sieves was returned for additional crushing. The upper, coarse sieves were of perforated sole leather or strong cast iron wire, while the lowest, finest sieves were of copper wire.⁹⁰

In 1831 the stamp mill at the St. Catherine Mill consisted of 12 stamp heads of wrought iron, each weighing 75 pounds. The wooden upright shafts were 11 feet long and 6 inches square and were divided into two sets of three. The stamp heads were moved by a breast waterwheel (figure 9), 14 feet in width and 18 feet in diameter, that had enough power to raise an additional 12 heads that were under construction at that time. Eight attendants were required to keep the 12 heads at full work.⁹¹

Chilean mills, used to crush the ore, were in common use at the leading mines by 1830 (figure 10). In the Chilean mill, stones attached to horizontal arms revolve about a central upright shaft. The processes of reduction, (crushing) amalgamation, and washing are all performed at the same time.⁹² There were, however, several problems associated with the workings of the mill. The speed at which the mill operated was crucial; the stones having to make (between seven and ten revolutions per minute depending on the nature of the individual ores. If they moved too slowly or too little water used, finely crushed ore would cake up on the bedstones and interfere with amalgamation, while if they moved too fast or if too much water used, particles of gold might be washed away with the waste and runoff.⁹³ Finally, the Chilean wheels were difficult to repair and adjust, having to be cut and shaped by experienced stone masons, and there were