as badly hammered up, and the number of missed shots small. These missed shots were easily set off by carefully cleaning out the hole nearly to the charge by the man who loaded it, and then inserting a small cartridge of a new fuse and half a stick that seldom failed to detonate the original charge, the ventilating exhaust described quickly drawing off the hot, smoky air, thus delaying work but a little. Such shots must be very carefully watched, especially if a large number has been exploded, for should the drill strike one that has been overlooked a bad explosion will ensue. One of the superintendents of this tunnel, afterwards in another mine, was caught in just this way while going his rounds, and on stepping up to the machine just as it struck the charge the man had neglected to notice had not exploded.

Mining—Tunnelling is begun by making a good entrance, if in rock, by putting in a strong well-cut set of timbers and a good door or gate; if in wash, by clearing away at once all loose stuff and timbering or walling up the approach to the opening to prevent caving in of the banks after heavy rains or in spring. For the first 100 feet or so wheelbarrows may be used for taking out the waste which at first is disposed of in levelling up outside and preparing for the tracks to the dump. Timbering will be needed until well into the rock, and usually close lagging, as water working through the wash would otherwise bring much soft stuff into the tunnel, besides the timbers are best kept close up to the face to forestall much unnecessary excavation, and to bar against the accidents liable in this often dangerous material.

The putting in of good solid tracking from the first will soon repay the extra cost, as it is surprising how the progress is increased by the use of good cars and tracks, when the maximum work can be got out of the trammers and the horses or mules, and vexatious and expensive delays caused by cars leaving the rails reduced to a minimum. The rails of at least 16 lbs. per yard, but preferably 24 lbs., are laid on the mud sills or on stout ties 4 feet apart and ballasted between with waste to make a good footway, or else planks are spiked down between the rails that have an 18 or 20 inch gauge carefully set. In this big tunnel 36 lb. steel rails made a firm steady track over which with ½ per cent. grade a 900 lb. mule easily pulls in a train of 12 or 15 heavy steel cars or trots out with the same loaded with 12 to 20 tons of rock or ore, a brake being necessary to control when going out.