

think one should hesitate, before installing such a plant, to count the cost and to decide whether the work had better be rushed with all speed and whether the compressor and drills can be put to real use after mining commences. In some camps compressed air becomes a perfect fad and every superintendent thinks himself behind the times if not using it. In a single track, work 100 to 180 feet per month by hand-drilling is quite possible if the rock is not extremely hard, but with air-drills the rate should be from 250 to 330 feet, 300 feet being good driving. In the big tunnel mentioned with two drills working in shale and afterwards hard dolomite, and breaking as much rock as the shovellers could well handle, the men were allowed pay as for two extra shifts if 300 feet was the month's advance, and it was astonishing to see the way they made the rocks fly and resented any delays, the result being that 320 to 330 feet was repeatedly the month's progress, while the star record for one month in softer dolomite, was 421.5 feet or 13.6 feet per day of completed tunnel.

If a head of 40 to 100 feet of water from a flume is available the compression of air is greatly cheapened by operating the compressors with Pelton water-wheels. The electric percussion drills now in the market have not as yet proved a decided success, but in time technical defects will surely be remedied.

In hand-drilling the placing of the holes depends greatly upon the character of the rock, although this influences but a little machine-drilling, in which two vertical rows of holes are drilled toward one another in the centre for breaking out the central wedge, and then parallel rows of somewhat deeper holes and such squaring-up holes as are required. Again three or four converging holes near the centre, especially in small tunnels, will suffice to make a good centre cut, and concentric rows of holes will complete the work, but all machine-men have their hobbies and a really good man will make much faster progress than one who knows how to handle the drill but not select the position for the holes. It might be said here that greater effect is secured by firing these centre cutting holes by electricity, but the others are fully efficient when snuffed.

*Timbering*—It is seldom that the rock in the tunnel will stand long without support, excepting some classes of granite, syenite, gneiss or firm limestone or sandstone, and as the primary object of timbering is to prevent, not check, the movement of the ground, it is generally best to