minimum of 5s. to a maximum of 9s. per ton. If the quartz does not average above 4½dwt. per ton the charge is 5s., and it gradually increases until the quartz averages 8dwt. per ton, when the maximum charge of 9s. is made.

The crushing-batteries in this district have nothing worthy of note to mention. They are fed by self-acting hoppers, which are considered by the managers here, as well as in other districts, no saving on hand-feeding. The stamp-boxes have gratings at both sides, and discharge the tailings back and front; but this system is not considered to have any advantage, as the tailings gets through the front gratings, as quickly as the quartz gets crushed. The ordinary quicksilver wells and riffle-tables, covered with copper plates, are next the battery. Next to these are tables covered with blankets, which are washed out at intervals, the sand collected and put into concentrating-tables, where the pyrites is saved. Afterwards the pyrites is ground in the raw state in small berdan basins about 2ft. 6in. in diameter, with a round cast-iron ball. The sand that runs away from the concentrator is collected in pits and stacked, and afterwards again put through the stamps; but there is no attempt made to save the pyrites beyond that which the blankets catch. I observed at some of the batteries here that rocking-tables, similar to those in the Maldon District, had at one time been in use, but they have been discarded, and are now used as stationary-tables, covered with blankets. The manager did not consider the rocking principle of any advantage.

Diamond- and Rock-Drills.—In this district every one speaks in the highest terms of the use of the compressed-air rock-drills, and asserts that these drills have been the means of a large amount of quartz being worked that would not otherwise have been remunerative; but, although the diamond-drills have been used considerably here, the miners do not seem satisfied with the results. They state that they sometimes mislead companies in passing through a layer of quartz, which, if of the same thickness as the drill indicated, would be of a highly-payable character, but in boring it is found, not only that the drill passes through the lode obliquely, but is deflected from the true line of direction. My attention was specially directed to a bore in the Oriental Company's mine that exemplifies both of these defects in the use of the diamond-drills. A bore of 400ft. in depth indicated a quartz lode of about 2ft. thick, but, when driven to, the supposed lode was only a few inches in thickness, and the bottom of the hole was 50ft. out of the position of the initial direction of the bore. This was not discovered until the company sunk their shaft and put in a level to work the lode, and when they came to the place where the hole ought to have been, could not either find the bore or any trace of a hole. After driving in several directions for some time, a plan was determined to try and test the direction where the bottom of the hole was by a clinograph and gelatine put down the bore-hole. They were successful in this, and found the vein where the hole went through, but it was too thin to pay for taking out. They therefore consider that, taking everything into account—especially in boring through silurian rocks, where there are hard and soft seams, that have always a tendency to make the drill run away from its initial direction—that very little more expense would prospect the ground far more satisfactorily in the ordinary manner with compressed-air rock-drills. There is no doubt in many instances cases like this would occur, and perhaps lead companies into more expense than they necessarily would have done, and cause people to buy shares at a price that the value of the mine did not warrant, as I understand was the case in this particular company; but, at the same time, diamond-drills have been successfully used in boring for coal, and through basaltic rock in finding alluvial leads of gold. But it is questionable whether they can be profitably made use of in testing quartz lodes, especially in New Zealand, where there are so many blocks and horses of mullock and barren quartz in the lode, and a drill might as readily go through one of these; and yet the lode, if prospected by a drive or tunnel, might be payable for working. Appendix A contains a report of the Acting Secretary for Mines and Water Supply, recently published by the Victorian Government, which gives a deal of useful and valuable information respecting the use and cost of working diamond-drills.

The use of compressed-air drills has been well tested, and they have proved to be a valuable appliance in both working and in prospecting for quartz lodes; and these drills are used by almost every company in Victoria to a large extent. Those most favoured in the Stawell District are Wayman and Kay's and Naylor and Thornton's. (The latter is largely used in the Reefton District, and gives great satisfaction.) Before these drills came into use, the National, Eclipse, and Ingersoll drills were employed; but it was found that from the extremely hard nature of the rock in this district it was difficult to get either of these drills to stand; indeed, several of the mine managers drew my attention to this, and showed me some of those drills completely smashed up by ordinary work; at the same time they informed me that the local-made drills stood and gave every satisfaction, while they are simpler in construction and lighter to handle. The lightest drill is that of Naylor and Thornton. It is manufactured by Robinson Brothers, South Yarra Bank, Melbourne, and costs about £90, with duplicate parts. Drawing No. 5 shows plans and sections of drill, and the principal improvements claimed by the patentees. The improvements in this drill are principally in the equilibrium valve, which the patentees claim enables the drill to be worked with a much less quantity of compressed air than any others to do the same amount of work. This valve (fig. 2) is an equilibrium circular valve made of cast steel, with double piston, with steel rings at each end, as shown. The valve cylinder is lined with cast-steel bush, and the air for driving the drill is admitted into the centre of the valve-box I, as shown in section, and is regulated with the main cylinder by the action of the piston, as follows: When the valve is at the end, as shown, the port C is open, and the cylinder of the rock-drill admitting air at the back of the piston drives the drill forward to strike the blow, and when the piston passes the port D, leading from the cylinder to the valve, the air rushes through the back of the valve, and forces it to the other end of the valve-cylinder, opening port C to exhaust-holes in the valve-piston, which allows it to exhaust through both ends of the hollow spindle of the valve. The other port CI is then opened to admit air from the valve to bring the drill-piston back after striking the blow, and so on it continues to make the drill go at a very rapid rate. The air used for driving the valve is exhausted through small ports