

has not been lost sight of. In one instance at least application has been made to patent an appliance designed on the lines of one of the suggestions thrown out in my report of last year. A scheme for dealing with the overburden by stripping in advance and depositing soil, &c., on the tailings in what appears a most simple and yet efficient manner—which, in the case of a new dredge, will add very little to the cost, and possesses adaptability to many existing dredges—has been submitted to me. With certain modifications this scheme presents the possibilities of a much greater breadth of tables than has hitherto been the case, and its consequently increased capacity for saving fine gold should be an advance on existing arrangements. Beyond the features named I am not at present at liberty to make the design public; possibly full details may be available shortly. That much fine gold (which ought to be saved) is lost owing to the mixture of clay and soil with the wash in the sluice-boxes, &c., goes without saying, and any plan which will prevent this and at the same time obviate the destruction of good land is worth consideration.

The fact that accidents resulting in the sinking of a few dredges have occurred at various places in the colony, necessitates, in my opinion at least, consideration as to the advisability of building the pontoons in watertight compartments. The necessity for this may not be so great in land-dredging, where the dredges are not, as a rule, so large as modern river-dredges, and the supply of water can be cut off the paddock and the latter drained, thus allowing the pontoons to be baled or pumped dry, and the dredge refloated by the readmission of water to the paddock. But on swift-flowing and deep rivers—such as the Clutha, Kawarau, Waiau, Grey, and Buller—the case is altogether different, and the sinking of a large dredge a much more serious matter. Although the risk to life may be small, the risk of damage and loss to property is considerable. The additional cost of dividing up the pontoons into watertight compartments would in many instances be money well spent.

On the West Coast rivers some difficulty has been experienced in working new dredges in respect to boulders, buried logs, &c., having to be encountered. In other cases ladders have been found to be too short: possibly this feature is due to insufficient preliminary prospecting. The dredges having been designed by engineers whose experience has been chiefly, if not almost entirely, gained in the Otago District, it has naturally followed that the lines which have proved suitable for Otago have been adopted in designing dredges for the West Coast. That such would not be entirely successful was only to be expected: to design really suitable dredges to meet the different conditions of the West Coast rivers and other dredgable areas, as compared with the conditions existing in Otago, a more extended knowledge of those conditions must be gained by experience, and the difficulties looked upon as of a temporary character only. When thoroughly realised they will no doubt be successfully grappled with and overcome. It has occurred to me that more grab-hooks, wider wells, and a crane fitted with grabs and situated at the bow might be advantageously adopted on large dredges working on West Coast rivers. Also, there is a possibility that in some instances, where heavy and frequent obstructions are met with, it may be desirable to have a man stationed at the bow to watch the buckets and grabs, and provided with the means of stopping the travel of the buckets, &c., at any point without having to leave his station. By this means facilities would be given for dealing with boulders, &c., as they are brought up; and such an arrangement might tend to prevent damage to hull and machinery. From the experience gained during the year it appears evident that, for dredging West Coast rivers to a successful issue, dredges must be large, strongly built, and powerfully equipped.

For dealing with fine gold and heavy sand such as is met with in the beach formations of the West Coast and elsewhere, dredges should be specially designed in relation to their arrangements for extracting the gold from the sand. At Waikaka, Southland, where the gold is fine, a similar arrangement of sluice-boxes and side tables to those in use at the hydraulic plants of the Round Hill Gold-mining Company (see photograph) has been adopted, but on a smaller scale. This is said to be giving good results, and to materially increase the amount of gold saved in comparison with the arrangements previously in use. Two dredge-managers in this locality (Messrs. H. W. Parsons and G. Lee) have recently patented an invention having for its object the prevention of loss of gold where clay-lumps have to be dealt with on dredges or at hydraulic-sluicing plants. I have not yet seen the appliance, but quote the following description from the *Otago Daily Times*: "An invention that bids to be of great importance to mining companies has just been patented by Messrs. G. Lee and H. W. Parsons. The appliance is very simple, and is not likely to get out of order. It is equally applicable for any description of gold-saving where either lumps of clay or stones have to be dealt with. The machine, which is placed, when on a dredge, between the buckets and the screen, and, when used at a sluicing plant, between the striking-plate and the tables, consists of a number of revolving forks, the prongs of which are placed at the distance apart that is necessary to take up stones above the required size, so that the ripples or screen or boxes, as the case may be, are not worn by the constant friction of boulders or lumps of clay that might rob gold. The revolving forks simply pick these up and pass them to another cross-box leading to the elevator or tailings, as the case may be. Even in the case of lumps containing gold these could be there separately treated, while in stony claims the invention will doubtless have a high value, especially as it could be placed on most existing plants."

It is very probable that much experimenting will have to be done to ascertain the best method of saving the fine gold on dredges working beach-ground. Generally, it may be found that the essentials to success are tables of large width and area, the sands, &c., being distributed evenly at the head of each run. To effect this a mixing-tank with suitable launders to convey the water and sand, &c., to the head of each run might be an advantage. The cloths with which the tables are covered will have to be washed frequently, and it is a question whether some arrangement of endless bands of suitable cloth or plush, revolving round rollers, and provided with means for being mechanically washed, might not also be adopted. Something of this kind was designed and shown to me by Mr. J. Tyson, of Miller's Flat, Otago, about two years ago.