

The converging-box is covered with cocoanut-matting, and also the tail-box for the first 6ft. in length. The dredging is done by the centrifugal-pump, which is constructed so as to pass stones and sand that enters the suction-pipe without grinding or choking. The fan of the pump is 18in. in diameter, with three carved arms, with an increasing pitch, and 4½in. in width. The water and material enter the centre of the fan and passes out at the periphery. The fan is constructed very strong, so as to prevent any damage taking place from shocks by stones striking against it, or other substances passing through.

The pump is bolted down to a cast-iron bed, to which are also bolted the brackets holding the bearings in which the steel shaft of the pump runs. From the pump are two intermediate pipes running at right angles, each being connected to a wooden joint-stand, which also supports the universal joint and the mast used for raising, lowering, or adjusting the dredging-pipes. The universal joint to which the dredging-pipe is attached is so constructed that the pipe can be raised or lowered through an angle of 90°, and swung round through a semi-circle; or even, if required, through a whole circle, whilst the pump is working. This enables the dredger being worked over a large area without being moved.

The dredging-pipe, which is a rolled iron gas-pipe, is in suitable lengths, and bolted together by means of flanges having india-rubber washers between them. As the material can be raised from any depth below the surface of the water without requiring any extra power, the pipes are constructed so that successive lengths can be added till the required depth is reached. At the end of the dredging-pipe is a nozzle: this is, in reality, a cast-iron sleeve, affixed by set screws round the lower end of the dredging-pipe, sufficient space being allowed between it and the pipe to admit of water passing freely. The water rushing down the space between the pipe and nozzle loosens and tears up the ground, which is then sucked up with the water through the pipe into the pump, and then forced up to the hopper at the head of the washing-tables. By raising or lowering this nozzle the proportion of material to water can be regulated, and the choking of the pipes prevented. The diameter of the two dredging-pipes is 4in., and the nozzles are 9in. long, and the width between them and the pipes is 1in. There is also another form of nozzle used for hard ground. It is a rake with four arms, provided with strong steel teeth, fastened in the centre to a spindle, which passes up the pipes. This has a propeller attached to it, worked by the upward current of the water. Each line of pipes has a wooden crane provided for the purpose of raising, lowering, or swinging the pipes. The special features of the Wellman patent are the universal-joint, which allows all the ground being worked within the radius of the pipes; and the nozzle, which, from its construction, forces the water to enter the pipe from above, and thus prevents choking.

In order to start the pump it is necessary to fill it with water, and this is accomplished by means of a steam-ejector from the boiler. When the pump is full the engine is set in motion, and the water impelled by the curved blades of the runner up the delivery-pipe, and its place immediately supplied by the water and material constantly rushing up the dredging-pipes, which pass through the universal-joint; thence into the pump."

With regard to the ultimate success of these dredges I think there is little doubt; but the present one is a mere toy, and not suitable for dredging on the beaches. The principle is good, and alterations will no doubt be made that will make them suitable for the work they have to do. The centrifugal-pump requires to be longer, and the pipes should be at least from 10in. to 12in. in diameter, so that good-sized stones could be lifted. Also, all these description of dredges should be placed on a punt, so that they can be shifted about anywhere. If the pipes were sufficiently large, and plenty of motive-power to work the pump, there is no doubt it would lift a large quantity of material from a good depth; but after the sand is lifted there is another element to be provided for—that is, separating the rough shingle from the fine sand; if the whole of the coarse shingle and boulders which are lifted are allowed to pass over the tables where this fine beach gold is collected there will be a considerable loss of gold.

Mr. Brooke-Smith was landing a ball dredger at Hokitika during my visit there. His dredger is larger than Mr. Parkes's one, the latter being constructed on the Wellman principle. The pipes are made of steel, and each joint is faced on a turning-lathe. Mr. Brooke-Smith also has, in conjunction with his dredge, one of Preistman's grabs for lifting up stones. This will be required, for the 7in. pipes are not large enough to take up the coarse shingle and stones that are found in the ocean-beach wash. The pump and steam-engine and derrick-crane will be placed on a punt. The place where Mr. Brooke-Smith's company intends to commence dredging operations first is at the Five-mile Beach, below Okarito. This was in former years one of the richest beaches on the West Coast, and there is yet a considerable length of it that has never been worked below the surface.

To sum up the prospects of the dredging companies on these ocean-beaches, I think the present dredges will be a partial failure; they are not large enough, nor sufficiently powerful, nor have they any proper appliances for separating the coarse shingle from the fine sand before it goes over the washing-tables. They are, however, constructed on a good principle, and I have no doubt when they are improved to suit the work they have got to do, they will prove a success, especially in working ocean-beach leads; and will be the means of giving remunerative employment to a large population.

TOTARA DISTRICT.

This is a district in which almost every class of mining is carried on, and it is the only place in the colony where there are any very deep alluvial leads of gold. The deep workings were carried on for a number of years, but the influx of water became too great for the machinery employed, and, in addition to this, the quantity of gold in the wash-drift became less as it got further into the flat. Hydraulic sluicing is carried on here to a considerable extent, and recently auriferous-quartz reefs have been discovered at Cedar Creek.