

The Priestman Dredge.

It has often occurred to me that, with a modification of the well-known Priestman grab, this style of dredge might be advantageously used for working in places where boulders, buried timber, and other obstructions have to be encountered. Also that a pontoon with a small crane and Priestman grab might be used for prospecting in rivers where it is impossible to prospect by shaft-sinking. In a case of this kind the material raised could be emptied into boats, and treated in a sluice-box on the river-bank, in order to minimise the size, weight, and expense of a purely prospecting plant, in which, as a matter of course, portability is an important consideration. My fear was that, with the grab as ordinarily constructed for harbour-dredging and similar work, gold would escape during the act of lifting the loaded grab from the bottom to the hopper or other receptacle into which the gravel is deposited prior to treatment. Learning that Messrs. Priestman Brothers (Limited), of Hull, England, had given some attention to the adaptability of their machines for gold-dredging, I communicated with their Australasian representative, Mr. J. W. Jaffray, engineer, of Sydney, pointing out the views expressed above. I cannot do better than quote from Mr. Jaffray's reply, in which he says,—

"*Escape of Gold.*—At the outset, I am glad of the opportunity to refer to your remarks under this head. It is one that is being used very freely against the Priestman grab-dredger here by those who are interested in the manufacture of the ladder dredge, and, indeed, it is the only forcible argument that seems to strike them to use against its adoption. Of course, there might be some reason in what they say if a grab were used of similar construction to what is used in dredging the generality of muddy rivers.* But you will notice from the particulars forwarded that the grab recommended for gold-dredging is constructed so as to close up entirely, the short tines (which are constructed at the mouth of the grabs) being so arranged that in the closing of the grab they fit one into the other, and thus make practically a solid bottom, so that really nothing can escape. But, in addition to this arrangement, it must be borne in mind also that this grab is lowered down to the bed in a perfectly extended (or open) position, and before it commences to rise at all the action of the chains serves to close the grab up. Thus, in the act of closing, it at the same time compresses the material hard together, leaving no chance for any gold to escape. I think the mere mention of this fact will be sufficient to show the unreasonableness of the objections raised against us on this score."

Mr. Jaffray has kindly forwarded drawings showing the general arrangements of a Priestman dredge adapted for gold-mining purposes. These are reproduced.

Unlike the ordinary ladder-and-bucket dredge, which raises the material in buckets holding comparatively small quantities—about twelve buckets per minute being emptied into the sluice-box or screen—the Priestman dredger lifts from 1 to 2 tons at a time, the process being intermittent, as contrasted with the constant steady delivery of buckets. Any objection which might be raised to the delivery to the screen or sluice-box of so large a quantity of material at one time is met by the adoption of a receiving-hopper, at the bottom of which an oscillating grating or grizzly is fitted. Reference to the drawings will show that two revolving screens are provided. The action of the oscillating grating subjects the dredged material to a rough screening, and so separates large stones (which would otherwise pass through the revolving screens) from the material to be treated by the gold-saving arrangements. These large stones are carried away from the dredge by inclined shoots projecting some distance over each side. The material to be treated falls through the oscillating grizzly on to shoots, which direct it in a regulated stream into the revolving screens. From this point the treatment is identical with that of the modern ladder-and-bucket dredge.

It is well known to those who have had any experience of the Priestman dredge in connection with harbour-works and undertakings of a like character that large boulders, heavy pieces of blasted rocks, and tree-trunks or stumps can be removed without much difficulty by means of this machine. Where a dredge of this kind is used for gold-dredging a barge could be kept alongside, into which boulders and other obstructions could be deposited by the grab. Other conditions being favourable, there appears every reason to think that the Priestman dredge will be found of great value in working auriferous rivers and flats where obstructions such as those above referred to exist, but how it will answer in tight ground remains to be proved. It is claimed that the wear-and-tear on a Priestman dredge is less than that with the bucket dredge. Judging from a quotation for the machinery for a dredge having a lifting-capacity of 70 tons per hour, I do not think the initial cost would be more than for a well-built dredge of the bucket type having a similar capacity, and the labour requirements would be practically the same.

From the drawing it will be noticed that the dredge can be made to propel itself by a screw propeller. This can be fitted at either end to suit requirements, and might answer very well on flats. For swift-flowing rivers such as the Clutha, Kawarau, Buller, Grey, and others in this colony the winch arrangement as generally adopted on bucket dredges is a necessity.

GOLD-DREDGING: CONDITIONS WHICH IT IS NECESSARY FOR A DREDGE TO FULFIL IN ORDER TO OPERATE SUCCESSFULLY.

Mr. R. H. Postlethwaite, formerly of the New Zealand Engineering and Electrical Company, Dunedin, New Zealand (a firm having a lengthy experience in dredge-building), and now of San Francisco, U.S.A., has contributed the following paper to *Mines and Minerals*:—

Gold-dredging has been, until quite recently, considered by experienced miners either as an occupation for a crank or as a method adopted by the needy promoter for the extracting of money from his wealthy but weaker and more unenlightened neighbour. Now, however, in consequence of the invention and introduction of suitable and adequate machinery, as represented by the most modern type of gold-dredge, all this is changed, and the industry of securing the gold from the alluvial deposits scattered throughout California and other States of the Union is coming into

* Dredging for navigation purposes is meant in this connection.—J. HAYES.