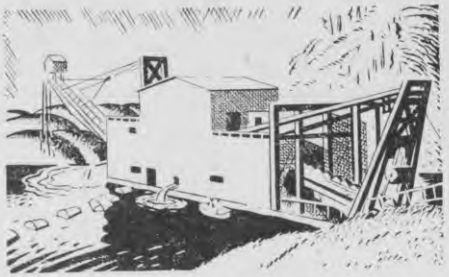

An alluvial gold-dredge of the older wooden type. The "tailings" piles are in the left background below the elevator.

level, water must be carried to the site by means of a flume or race.

First the ground is prospected by boring and the results assayed. If the ground is found to be payable, the 12 ft. steel pontoon is erected and floated and the superstructure built. Just how huge the dredges are will be realized by the fact that on the biggest of them the stern gantry, carrying the elevator, is 104 ft. above the pond-level. A massive steel ladder carrying the bucket-chain can be raised or lowered from a huge bow gantry by large blocks, each with twenty-eight sheaves of $1\frac{5}{8}$ in. steel cable. A 250 h.p. winch controls the ladder.

The buckets, of which there are 94 on the largest dredges, each carry 18 cubic feet of spoil and tip at the rate of $21\frac{3}{4}$ per minute. Tearing into the shingly earth they rip the ground from top to bottom to a depth of over 100 ft. With groans and wails (they cannot be lubricated) the buckets steadily climb the ladder, and with an especial shriek crash their boulders and rubble into a huge steel hopper. A strong jet of water flushes each bucket as it deposits its load.

Inside the dredge is like the engine-room of a gigantic ship. Steel riveted plates form the deck, and strong steel girders the framework covered by corrugated iron. Long ladders lean up to the heights where the buckets can be watched as they deposit their spoil.

From the hopper the wash passes into an immense revolving cylindrical screen perforated with $\frac{1}{2}$ in. holes. Strong jets of water play on the protesting stones as they slide down the angle of the screen. The finer wash drops through into a distributor, while the larger stones pass over a nugget screen of larger perforations and out on to a long elevator belt which carries them out to the tailings pile at the back of the pond. The fine wash is sent out by the distributor to the ripple tables below the screen—twelve to each side. Each 12 ft. table carries 200 ripples of angle iron on a wooden base, and over these the gravel is washed by a continuous stream of water boiling over the slight elevations of the ripples and depositing its fine gold. The distributor ensures an equal proportion of wash to each ripple table, where most of the gold is caught in the first few feet of ripples. These are locked off with a wire grid.

In the older wooden dredges the ripples are 1 in. wide, and 1 in. apart, and $1\frac{1}{4}$ in. deep. Without the distributor the first three tables collect the majority of the valuable concentrates. On the modern dredges a pulsating screen is used in conjunction with the ripples, the wash flowing first over the ripples, then over these "jig boxes," and on to further ripples. On the older dredges mercury is scattered about the ripples to amalgamate with the gold. The modern type collect the wash first, by lifting the ripples out and washing them, collecting the sand by shovel and passing the resultant wash through the "streaming-down" box over fine ripples and coconut matting. To these concentrates is then added mercury to collect the gold.

The revolving screen on a small dredge. Below the screen are the ripple tables. The angle of the tables is not as acute as is suggested by the picture.