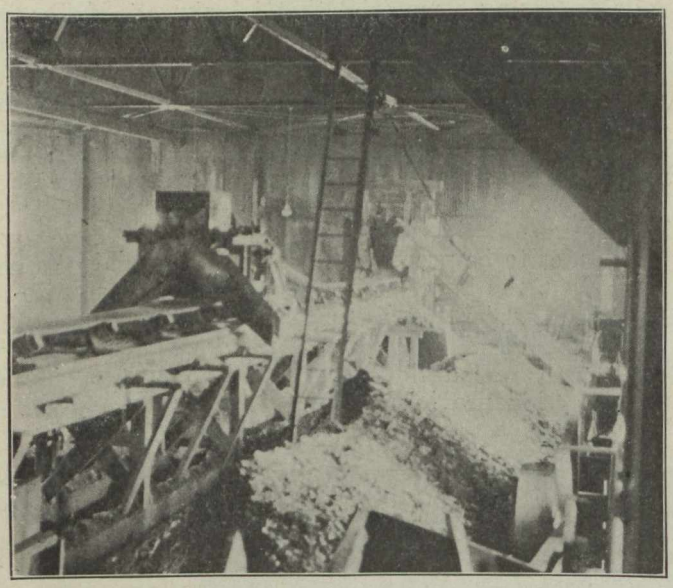
Crushing.

Preliminary crushing of the ore is done in Kennedy gyratory breakers. The open cut system of mining produces much ore that is over thirty inches in size. To handle such large lumps of ore a crusher with a wide jaw opening is required. A No. 7½ breaker takes the ore dropped from the mine cars and crushes it through an opening of about 6 inches. The broken ore is then elevated by a belt conveyor and screened over a grizzly having 1½ inch openings, from which the oversize goes to two No. 3 crushers. The secondary crushers reduce the ore to a size of 1½ inches, dropping it on a second inclined belt conveyor, where it joins the undersize from the grizzly and is delivered to the stamp mill bin. The crusher plant and conveyors are housed in a wooden building, which is divided from the main steel building of the mill by a fireproof door and partition. The ore is distributed along the top of the battery bin by means of a third belt conveyor, provided with an automatic tripper. The battery bin is of steel construction throughout, is flat-bottomed and has a capacity of about 1,600 tons.



View of Stamp-Mill Bins, Dome Mill. Shows Conveyor and Distributing Apparatus

Stamp Milling.

From the bin the ore is fed to four ten-stamp batteries by means of suspended Challenge feeders. The stamps weigh 1,250 pounds. There are independent battery line shafts behind the stamps, one for each 20 stamps driven by a 75 h.p. motor placed behind the ore bin on the ground level. The stamps make one hundred and two 6½-inch drops per minute, and crush through ten-mesh, rolled, slotted, wire screens. Several screens of different mesh have been used since the plant was started. The following table gives the average results in stamp duty and size of product when using the various mesh sizes:—

Effect of Screen Opening on Stamp Duty and Product.

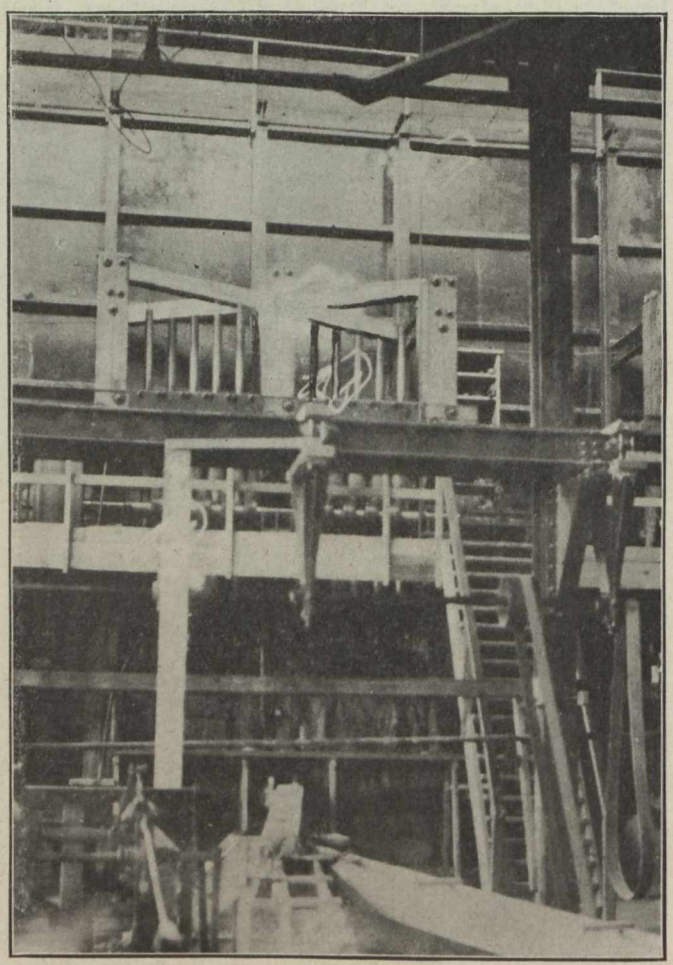
Battery Screen Used	Stamp Duty. Tons per Stamp per Day.	Screen Tests on Battery Discharge.			
		On 60-mesh %	On 100-mesh %	On 200-mesh %	Through 200-mesh %
16-mesh	6.8	41.6	8.8	10.4	38.8
14-mesh	7.9	62.0	6.4	6.8	24.8
12-mesh	9.0	64.0	7.0	6.0	22.8
10-mesh	9.6	59.0	15.0	7.0	19.0

Crushing through 10-mesh screens the stamps give the most economical results. About 7.5 tons of water are fed to the batteries for every ton of ore stamped.

Primary Plates Discarded.—When the mill was started there were eight primary amalgamating plates, one in front of every five stamps, each being 54″ x 144″ in size with a slope of 1½ inches per foot. It was found when the pulp was passing through 16-mesh screens the primary plates caught more gold than the secondary ones, which follow the tube mills. With 14-mesh screens the amount of gold caught on the primary plates was only slightly greater than that caught on the others, while with 12-mesh screens the secondary plates recovered more of the gold than the primary plates. When 10-mesh screens are used the primary plates recover very little gold and are difficult to keep properly dressed, owing to the scouring action of the coarse sand, hence the primary plates were removed after it was decided to aim at large crushing capacity per stamp.

The relation of the mesh of the screens used on the batteries to the recovery by amalgamation was found to be about as follows:

Using 16-mesh screens, the total recovery by amalgamation was 78 per cent.



View from Front of Batteries, Dome Mill. Note absence of Primary Plates.

Using 14-mesh screens, the total recovery by amalgamation was 75 per cent.

Using 12-mesh screens, the total recovery by amalgamation was 55 per cent.

Using 10-mesh screens, the total recovery by amalgamation was 46 to 50 per cent.

At the time when the highest recovery by amalga-