



Reinforced concrete collar, No. 3 shaft, Trimountain mine

combination continued through the larger elements of the mixture. The gravel mixture could doubtless have been improved considerably by careful washing, but the cost of preparation, compared with the trap rock and conglomerate sand, prohibited its use in this particular case.

"The materials finally used were as follows:

"No. 1 Portland cement. Conglomerate sand. Trap rock trommeled over  $\frac{3}{4}$  inch through screens. The proportions used were 1:3:5 in wall plates, end plates, and dividings, and 1:2:4 in studdles. The reinforcement in wall and end plates consisted of three  $\frac{3}{4}$  inch monolith steel bars with  $\frac{1}{4}$  inch webs, crimped onto them, together with two straight  $\frac{3}{4}$  inch monolith bars. The dividings were reinforced by four  $\frac{1}{2}$  inch monolith steel bars wound spirally with  $\frac{1}{4}$  inch steel wire, the whole presenting a column with square cross-section. Studdles were reinforced with two pieces of old wire rope  $1\frac{1}{4}$  inch in diameter. Reinforced concrete slabs were moulded for the shaft lining, the material used being fines of trap rock under  $\frac{3}{4}$  inch, conglomerate sand and Kahn expanded metal as reinforcement. The mixture used for slabs was 1:2:4. By way of

experiment, the writer selected a piece of No. 1 hemlock plank of the same length, width and thickness of a concrete slab, which had seasoned for one year, supported them at either end, and placed them side by side, and then applied an equal pressure across the centre of each. Three failure cracks appeared in the concrete slab just previous to the breaking of the hemlock plank, although total collapse of the concrete slab did not occur until the pressure was considerably increased. While the method of the test employed was crude, it proved to the satisfaction of the writer that the concrete slab was much superior in strength. Considering the rapid decay of timber used as shaft lining no further comparison of the two is necessary.

"In the moulding of the concrete sets, 2 inch No. 1 white pine was used in the construction of the forms. These were soaked in Delaney's wood preservative, and repainted with preservative on the interior each time before setting up, thus insuring them against warping and prolonging their lives indefinitely, as well as securing a smooth and easy parting from the concrete when removed. A Smith barrel type mixer was employed in preparing the charge for the forms. The