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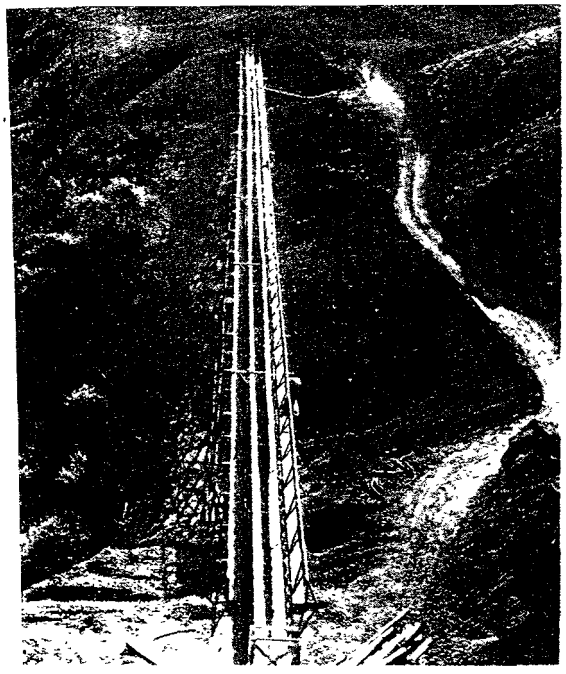
Permanente Is Now World's Largest Cement Plant

Two new kilns bring capacity of plant up to 16,000 bbl. per day



Belt conveyor line and tunnel from new sugar rock quarry

WITHIN a very few weeks The Permanente Corporation's cement plant near Sunnyvale California will be the largest cement plant in the world About two years ago construction work started on this plant and this construction work has never stopped First it was a two-kiln plant using the largest kilns available Before these were hardly broken in a third kiln was installed and now a fourth kiln is turning out cement while one of the first kilns installed is down for repairs As soon as installation of the new grinding units is completed all four kilns will be in use

A War Industry

Not only is the cement plant being enlarged at a speed that breaks all records but a small army of construction men is building a Magnesium Plant adjacent to the cement plant The constructors at the cement plant are proud of their accomplishments a new F L Smidth & Co kiln 11- x 464-ft. with ends enlarged to 12-ft was installed in 24 days from the date machinery arrived That is no small accomplishment when one considers that three to six months is the usual time for erecting such a huge unit New Allis-Chalmers ball mills 9½- x 10-ft new F L Smidth & Co finish mills 9½- x 10-ft primary and 8- x 36-ft secondary Dorr Classifiers with and without bowls Cottrell Precipitators Wilfley pumps—these and many other items are all being installed as one unit and with speed comparable to that of the kiln installation When this plant is completed as now planned there will be 17 grinding units, all of the largest size obtainable, and the plant will have a capacity of at least 16 000 bbl of cement per day making it the largest cement plant in the world.

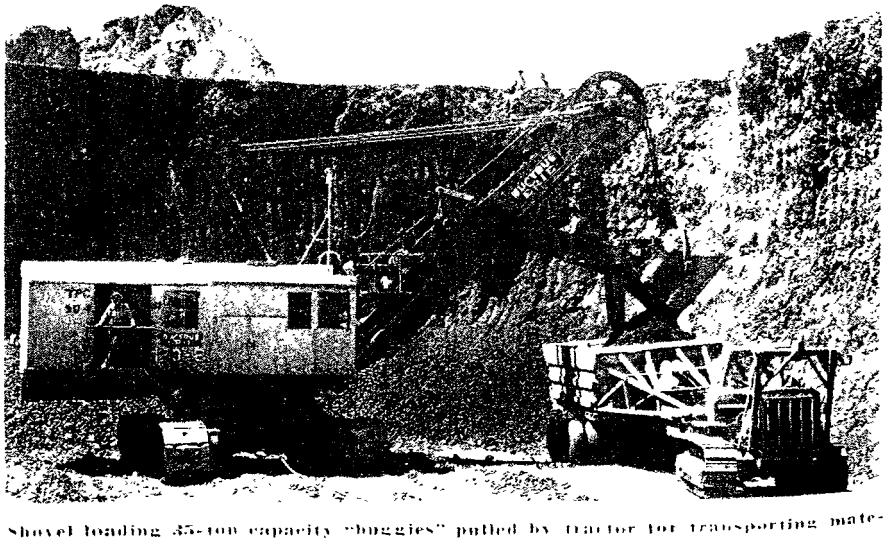
Cement for the Central Valley area the Shasta and Friant dams Madera-Bakersfield and Contra Costa canals has been classified as a defense necessity mainly because of the power to be generated The proximity of the metallic magnesium plant is another reason for placing the cement plant on a war basis

When you approach the new large and artistically designed office you are politely intercepted by an armed guard who asks the general nature of your business. He directs you to the proper official Possibly from that official a preliminary pass can be obtained to the plant The next step is to be photographed and some vital personal statistics recorded before the final permit to the plant is obtained Armed and uniformed guards are at all gates and others patrol the very large area taken up by the combined operations Each day one must check into the plant and check out as well. Cameras are strictly forbidden in the plant and any photographs must come from the company's own staff photographer

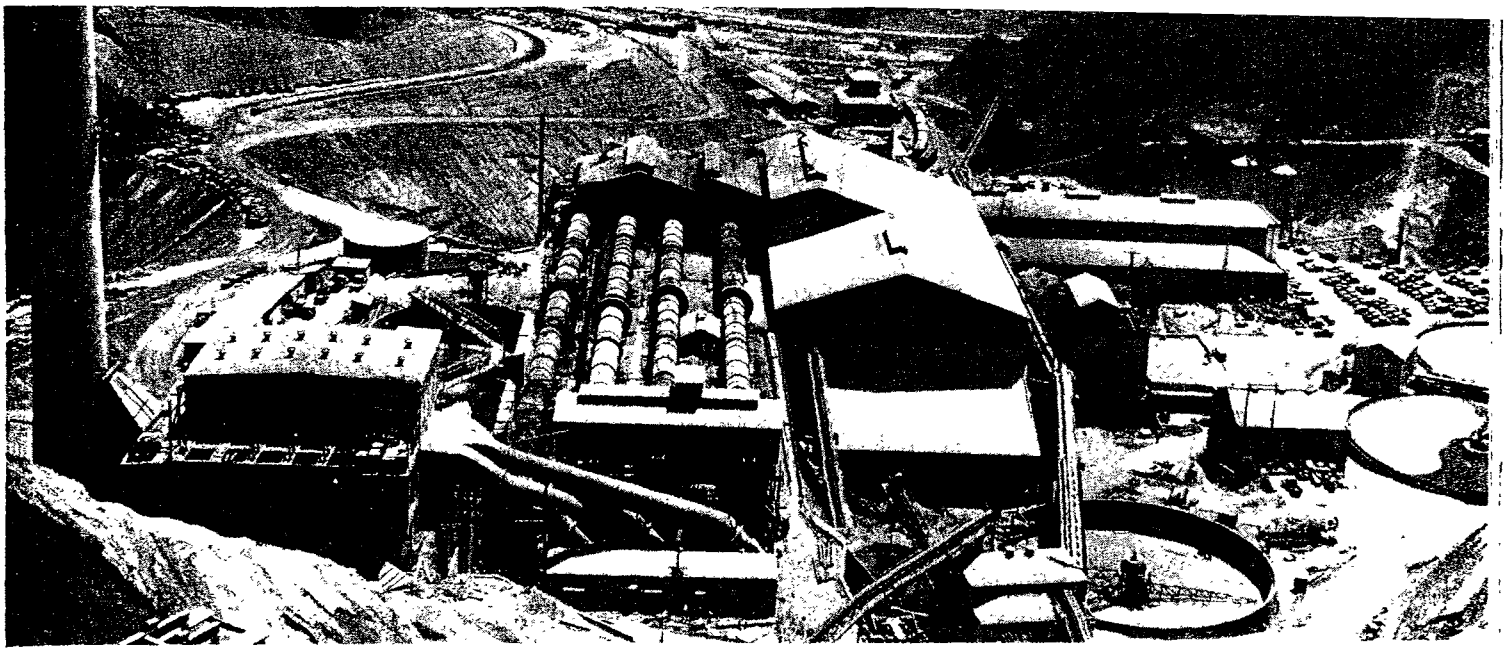
Enthusiastic Organization

Many changes have taken place within the plant since ROCK PRODUCTS published a description December, 1940 issue and the project is so large with day to day changes being made that even the operating staff itself has a hard time keeping up with what is going on Surveyors dot the yard, and it is with difficulty that you can find a place to park your car, and the chances are that when you return to it your car will have been moved and a cat or "bull-dozer" or a crew of men will be working on the foundation piers for something or other It is very remarkable, this spirit of the men, their desire to get the job done

This drive behind the organization starts from the top with their president, Henry J Kaiser The men at the plant say that the article recently published in the *Saturday Evening Post* was only half of it They tell of his ship-building project already launching ships before the ship yard was completed They first started construction of that yard with pile-



Shovel loading 35-ton capacity "buggies" pulled by tractor for transporting materials from the quarry

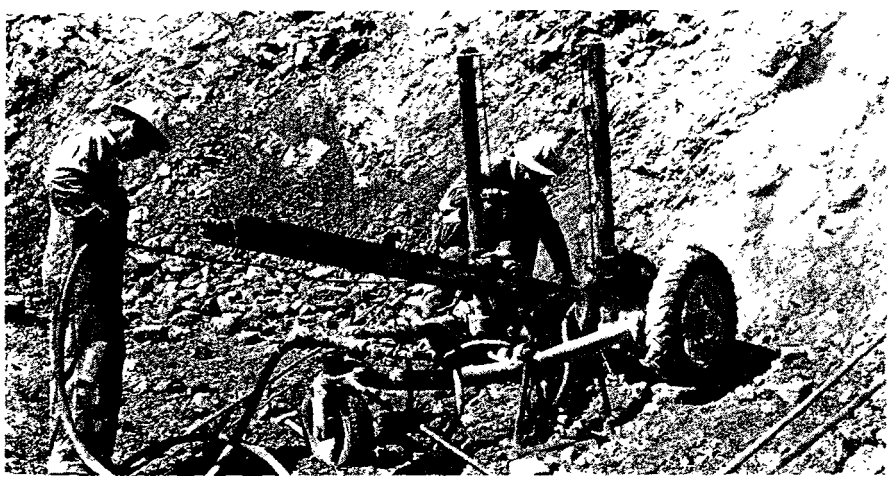


Looking down at the Permanente Corporation plant as it appears today with four kilns having a capacity of 16,000 bbl. a day

driver crews As soon as the ways were started keels were laid for ships: the construction of the ships keeps pace with the construction of the yard and according to our information, a ship was launched long before the yard was completed. The same kind of ingenuity seems to pervade the whole organization

Just when the cement plant would be finished, no one could say Possibly it will be before this is in print, but some expect before the new unit is completed another enlargement program may be under way, for the cement is going out as fast as produced, and the clinker storage facilities are empty. All salesmen have been taken off the road and put at other work; and for some of the cement for the Central Valley Project, and for other major customers, the company has had to go on the open market

The cement is going to the Shasta dam, to Friant dam, to Panama, Wake Island, Pearl Harbor, and other Pacific island bases. Bulk cement is hauled from Permanente to Redwood City, in specially built trucks and is then loaded into ocean going ships such as the Matson Navigation Company's S/S "WAIMEA", for the ocean trade. (Before the Japanese crisis, Japanese boats also hauled cement in Pacific waters.) Some 30 to 60 box cars loaded with bulk cement leave the plant each day for the Shasta dam alone.



Churn drill rig and crew preparing for a "shot"

Operating Technique

The specifications for the Shasta cement require a low heat cement, and with the alkali content below 0.6 percent. To meet these specifications requires strict laboratory control. Fortunately, the deposit is favorably constituted for this grade of cement and no selective mining or quarrying is needed

Many of the new units installed were to increase capacity; others to improve the over-all efficiency such as the installation of a 12-ft wide Dorr FX classifier in the secondary grinding circuit. Here it was found that if the clay were removed from the cement rock, better settling was experienced in the Dorr thickeners The minus 3/16-in. or $\frac{1}{4}$-in. material from the screening plant, operated as a part of the secondary crushing plant, is sent to this classifier. The sand (coarse) portion is returned to the cement rock storage conveyor by a short belt. The overflow (fines) goes to No 3 thickener —a newly installed 125-ft Dorr traction type The underflow is ground with the clay. Some calcium carbonate is thus put into the clay, but not enough to matter a great deal. At times a newly installed Oliver filter is used to decrease the water content of the underflow from the thickener. This is a rather novel deviation from standard practice, and the net result of its installation will be watched with interest.

Another installation that is possibly new to the cement industry will be the use of a Bird centrifuge that will operate in conjunction with a Pennsylvania hammer mill and a Traylor ball mill for the grinding of clay. The clay (about 12 percent of the total raw mix) will first go to the Pennsylvania, reversible mill (size C938, serial 1275) operated by a 125-hp Auto-Start ball-bearing, U S. motor. The hammer mill will serve a $9\frac{1}{2}$- x 10-ft. Traylor ball mill in closed circuit with a Dorr classifier (12-ft. wide FX). The classifier overflow will go to a constant head tank