

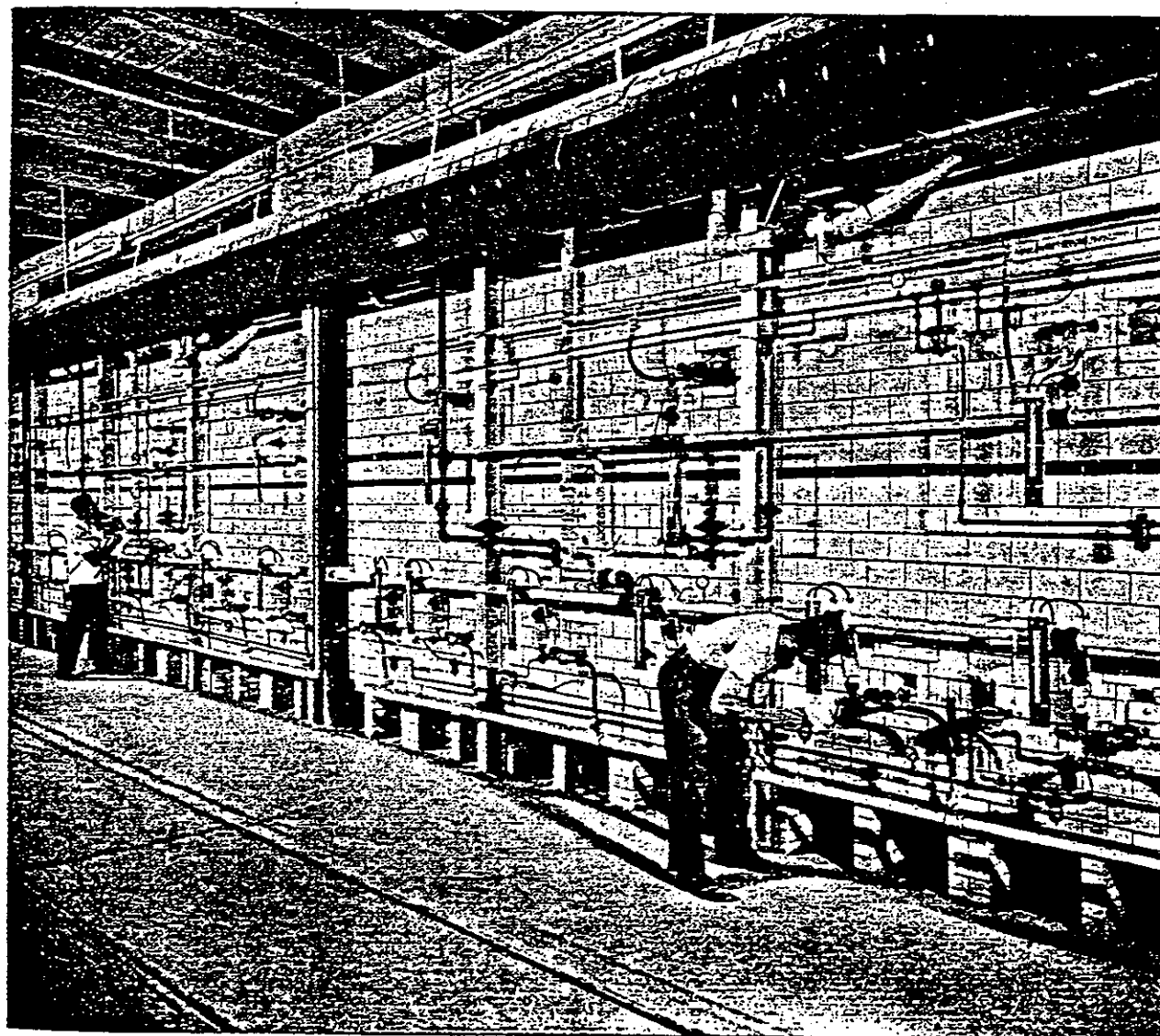
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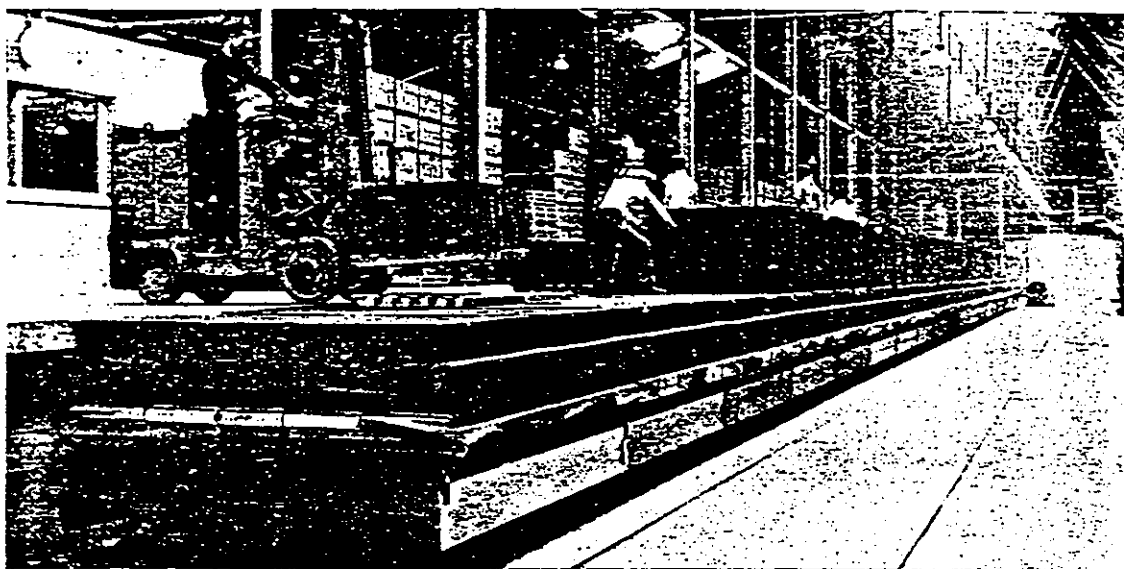


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Brick made at the new Baltimore basic refractories plant of Harbison-Walker Co., are unloaded by fork-lift trucks from tunnel kiln cars in the storage building.

HARBISON-WALKER'S NEW BALTIMORE PLANT

The new basic refractories works completed last November at Baltimore, Md., by the Harbison-Walker Refractories Co., was built with the objective of making it the most efficient plant of its kind in operation.

The company's own construction department built the plant, incorporating in it ideas gained from experience at Harbison-Walker's two other basic refractories plants, and several other refractories works of various kinds operated by the company.



A. M. Tvergaard

The plant turns out several kinds of refractory products from blends of chrome ore and magnesite, and from the company's exclusive forsterite ($2\text{MgO} \cdot \text{SiO}_2$) refractories, which are made from olivine.

These are sold as brick, ramming mixes and castables, and metal-cased brick.

Superintendent of the Baltimore plant is Aage M. Tvergaard, who came to Baltimore from the Cape May plant of Northwest Magnesite Co., a partly owned subsidiary of Harbison-Walker. Mr. Tvergaard was born in Denmark in 1908, and first came to this country in 1930 while employed by the F. L. Smidth Co., of Denmark. He has been in the cement and refractory materials fields continuously since then.

The new District Superintendent for the Baltimore and Chester, Pa., plants of Harbison-Walker is Thomas W.

Lloyd, who has been Superintendent at Chester since 1941. He is a native of Portsmouth, Ohio, and has worked for Harbison-Walker in several plants since joining the company in 1929.

Mr. Lloyd had attended The Ohio State University for two years before that time, and in the fall of 1937 he obtained a leave of absence to continue his education. In 1939 he was graduated from Ohio State with a degree of Bachelor of Industrial Engineering, and returned immediately to Harbison-Walker.

This plant is characterized by the almost complete mechanization of handling and transporting operations. All ore is delivered in hopper-bottom cars and unloaded, by means of a car-shaker, if needed, onto an apron feeder which provides a steady flow of material into the crushers, located underground. It is then moved on belt conveyors to floor compartments in the raw materials storage building.

There, the ore is loaded onto more belt conveyors by scoop trucks and carried to the grinding department, where it is ground and screened. It is separated into different grain sizes and returned to bins, each of which holds a specified kind of ore ground to a prescribed size. Some of the ore is reduced to powder in ball mills, in order to provide



Thomas W. Lloyd

all the grain sizes needed for proper batching. The feed to all grinding equipment is electrically and electronically controlled, insuring uniformity in operation.

From the first storage until the final batching operation, the three raw materials used in the plant are completely segregated. They pass through separate grinders, screens, and ball mills, and travel over three separate conveyor systems. There are dust collecting systems which remove dust from each operation and return it to the proper bin. This is both a health and cleanliness measure, and a means of avoiding material contamination.

The complete separation of materials eliminates the possibility of contamination which occurs when unlike materials are processed by the same equipment, and makes possible exact batch composition control.

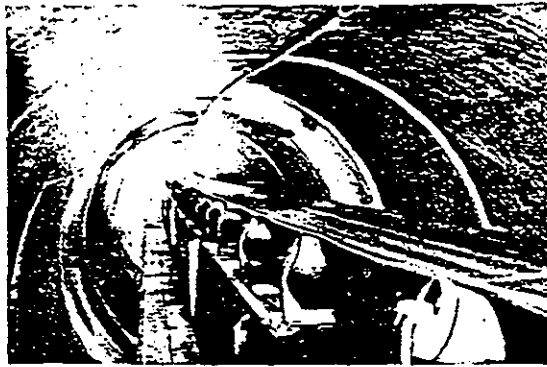
Gates at the bottom of the bins holding ground materials open into a batching or "larry" car which moves on rails beneath the openings of some 100 bins. In making up a brick batch, the car may make as many as twelve or more stops, collecting different materials in various grain sizes.

The larry car takes the batch to the mixers, from which the mix is automatically fed to the brick presses, or to the sacking or canning departments in the case of materials to be shipped in bags or drums. The pressed brick are placed by the operators on metal pallets, which are then handled by fork lift trucks. The brick are handled only twice as units in the entire course of manufacture and shipment, unless palletized shipments are required, in which case they are removed from the metal pallets and placed on wooden pallets before shipping.

About half the brick produced are chemically bonded.



As all raw materials are crushed upon arrival at the plant, no uncrushed ores are stored. The above photo shows compartments holding crushed ore in the raw materials storage building.

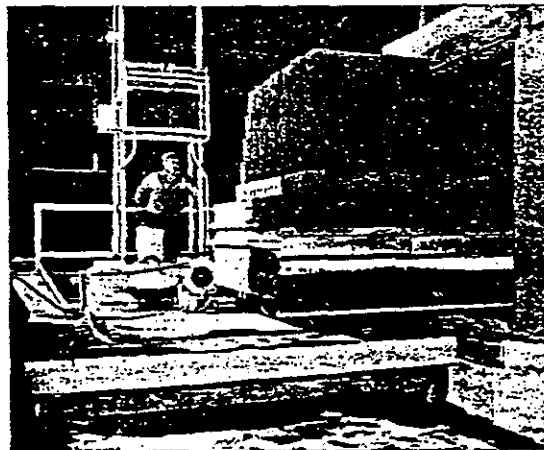


Conveyor belts like the one above, move most of the materials used in the new plant. This one runs from the primary to the secondary crusher at the plant.

The rest are fired in the plant's Swindell-Dressler tunnel kiln. This kiln is 324 ft. long and operates at very high temperatures. It is oil fired, and constructed of various types of Harbison-Walker refractory brick, making possible a comparison by the company of the performance of some of its own products.

Supplementing the close control of quality made possible by the high degree of mechanization are regular laboratory tests made on materials at each stage of manufacture. The plant includes a completely equipped laboratory, and additional tests are run at the company's central research laboratory at Hays, Pittsburgh, Pa.

For an account of the beginnings of the Harbison-Walker Co., and the life of Samuel P. Harbison, see the June, 1941, *Bulletin*, pp. 210-13



A car of fired chrome brick is pulled from the tunnel kiln at the plant.