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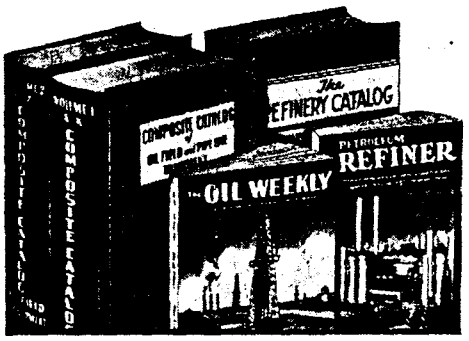
PETROLEUM REFINER

SPECIALIZED FOR THE OIL REFINING INDUSTRY, INCLUDING PETRO-CHEMICAL ENGINEERING, PETROLEUM SYNTHETICS AND NATURAL GASOLINE

A Gulf Publishing Company Publication

PUBLISHED MONTHLY AT 3301 BUFFALO DRIVE, HOUSTON, TEXAS



SPECIALIZED OIL JOURNALS

Published by

THE GULF PUBLISHING COMPANY

Post Office Box 2608, Houston 1, Texas

R. L. DUDLEY, *President*

A. L. BURNS, *General Manager*

TOM W. NELSON, *Advertising Manager*

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HOUSTON: 3301 Buffalo Drive,
Charles Wyatt.

Single copies 35 cents (except special issues). Subscription price, domestic and foreign, $2.00 a year; 2 years $3.00; 3 years $4.00. Entered as second class matter June 16, 1923, at the post office at Houston, Texas, under act of March 3, 1879. Advertising rates on application.

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Mexico's Two New Refineries Models of Newest Insulation Methods

H. R. MORRIS
Materiales Aislantes, S. A., Monterrey, Mexico

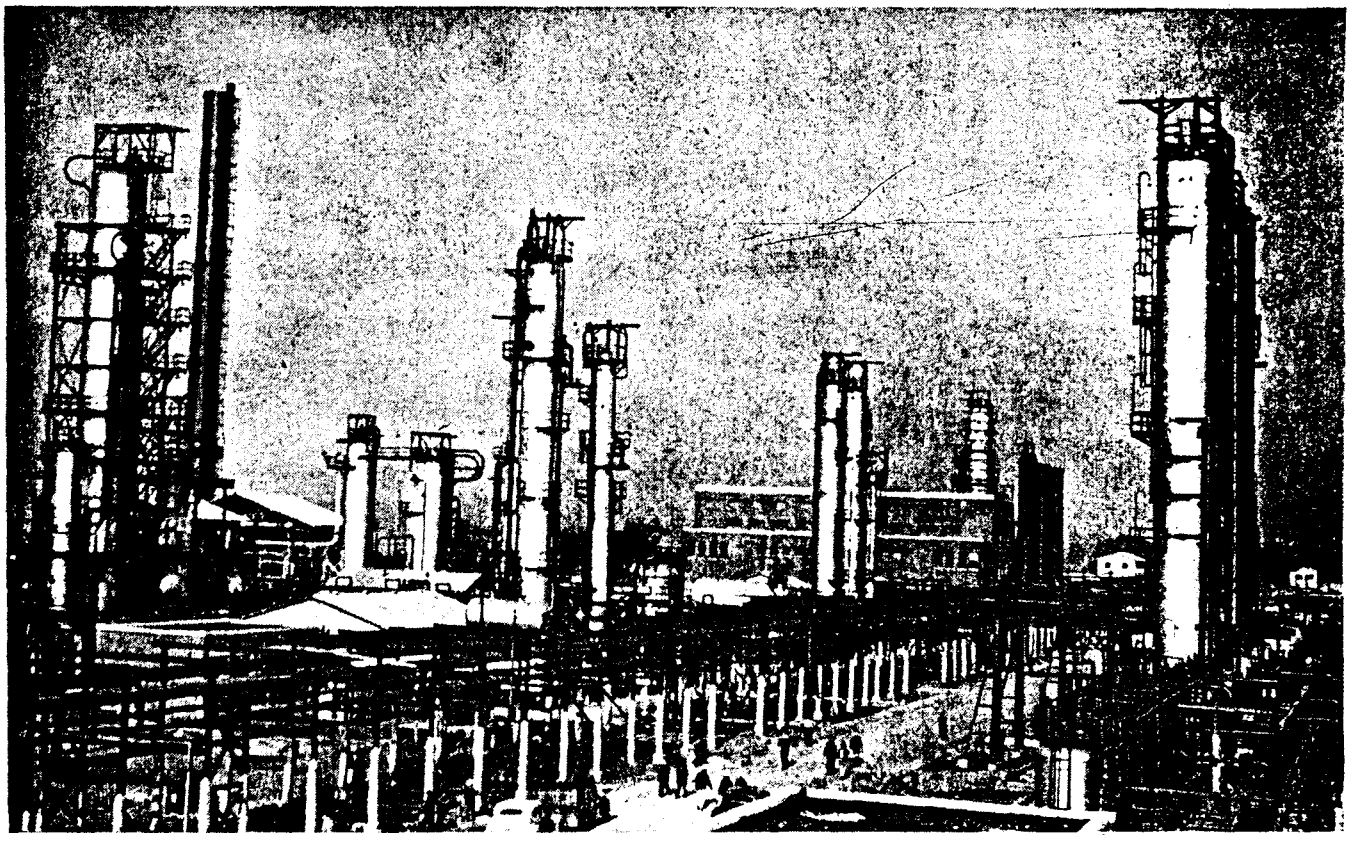
THE value of thermal insulation is becoming better recognized by those who design and operate petroleum refineries as the processes become more highly specialized and higher temperatures are encountered. Temperature control is more and more a "must" as newer methods are introduced, calling for operations requiring maintenance of temperatures within narrow limits.

These facts have been taken into consideration by engineering firms specializing in refinery design and construction and their specifications for materials and method of application are becoming much more exacting. Arthur G. McKee & Company is one of the firms whose engineers write into their insulation specifications the most complete and exacting requirements, drawing upon years of experience in this line.

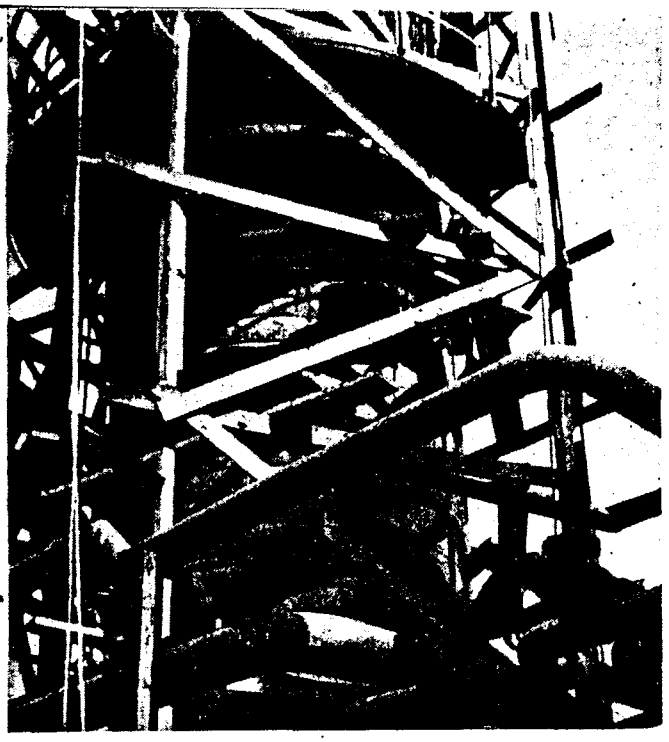
A case in point are the two modern refineries for Petroleos Mexicanos. One of the refineries is located at Atzcapotzalco in the Federal District and consists of a crude unit, thermal cracking unit, a Badger and Braun unit, isopentane and isobutane fractionation unit, isomerization and an alkylation unit, as well as power plant, storage tankage, etc. The other, at Poza Rica, Veracruz, in the coastal oil producing area consists of a gas-gathering system, primary topping and fractionation units.

The insulation chosen for the lagging of all towers, heated vessels, heat exchangers, spherical tanks and other equipment was mineral wool felted between layers of metal fabrics. These blankets, made up in sizes 2x8 feet, were suspended from rings welded on to the towers at intervals of 12 feet. After being hung loosely in place in a vertical position the blankets were secured in place by 5/8-inch strapping, machine stretched and sealed on 8-inch centers, the exposed surface of the blanket insulation being of expanded metal lath.

The mineral wool in the blankets was carefully felted and compressed so that the tightening of the



Section of Atzcapotzalco refinery, showing insulation and waterproofing finished and painted.

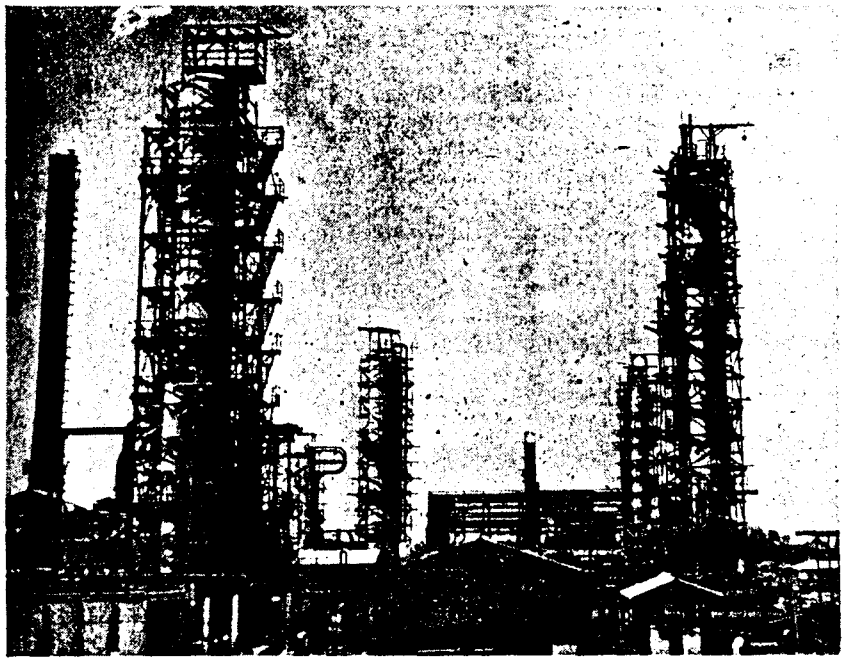


Mineral wool blankets banded in place on fractionating tower.

The piping insulation being applied at Poza Rica where the tropical climatic conditions are very severe is also of a mineral wool base. This rugged, heavy-duty type of lagging, made up in 2-foot lengths, with "keys" to fit the outer circmference of the pipe also presents an expanded-metal lath surface on the exposed side and is given a smooth dressing of mineral wool insulating cement. Each joint of the metal-lath-clad piping insulation is laced firmly together at butt ends with fine galvanized soft-iron wire. The finished insulation is given a dressing of 3-ply roofing felt secured in place by 14-gauge galvanized wire on 6-inch centers.

All valves and other fittings to receive insulation were built up to the thickness of the adjacent pipe covering with mineral wool insulating cement and given two coats of fibrated asphaltic emulsion weather seal.

In sections of the refineries having the greatest fire hazard, as in the vicinity of the heaters in the thermal-cracking unit, all piping was given a jacket of galvanized iron of 24 gauge.



Mineral wool blankets and insulating cement in place and weatherproofing being applied to thermal cracking unit.

Weatherproofing coat being troweled over the mineral wool insulating cement.

straps did not cause "valleys" to appear in the surface of the insulation. At each of the rings on the tower an expansion joint was provided, allowing for vertical expansion and contraction of the vessel.

The mineral-wool-blanket insulation was chosen because of its low thermal conductivity coefficient and because, due to the resiliency of the felted material, expansion of the equipment can take place without cracking the finish coat, as would be the case with a more rigid or block type of insulation.

After the blankets were in place two coats of mineral wool insulating cement were applied by trowel and secured firmly in place with 1-inch galvanized hex mesh stretched tautly over the entire surface. An unusually heavy weather seal was applied, consisting of two ¼-inch troweled coats of fibrated asphaltic emulsion. The contractor believes that if you "save the surface you save all" and insists upon this rugged and extra heavy duty weather proofing. This surface is given two coats of aluminum paint, presenting a smooth and very attractive appearance.