

TECHNICAL BRIEFS

ENGINEERING DEVELOPMENTS HERE AND
ABROAD DIGESTED FOR BUSY POWER MEN

PIPING, SUPPORTS

An Unusual Defect in a Boiler Support, by Vulcan Boiler and General Insurance Co. A 228,000-lb-per-hr steam-generating unit revealed on inspection a deterioration of the vertical web of the main girder, Fig. 1.

This 5 ft, 2 in. girder is the built-up I-section type, Fig. 1, fitted with vertical stiffener angles on both sides of the web. It spans 31 ft.

One side opens on the boiler room. The other faces the fire, behind a sheet-metal casing that runs the length and width of the girder, leaving a 6-in. air space between casing and girder, Fig. 2. The plate had no ventilating holes.

Corrosion reduced the vertical web plate at the upper part from $\frac{1}{2}$ to $\frac{1}{8}$ in. in many places. In a few places corrosion had penetrated the plate. The vertical stiffener angles on the fire side had been reduced to paper thickness or completely wasted away. No deflection of girder alignment was detected. Fortunately the girder, built for 250-ton loading, had to carry only 70 to 80.

Two samples of scale and dust were taken. Both showed oxides of iron and were strongly magnetic. There seemed to be no trace of acid. The second sample did show silica, apparently from flue gas.

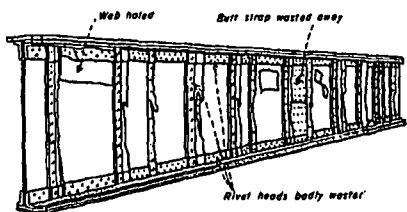
To prevent a recurrence an air space in the fire side of the girder has been provided. Plates $\frac{1}{4}$ in. thick form the casing. They are protected by a 17-in. refractory wall. Several 1-in. holes drilled in the web plate of the girder allow ventilation within the air space. Sight holes, 9 in. dia, have been cut in for inspection. *Vulcan Magazine, July 1947, pp 145-147, Vulcan Boiler and General Insurance Co, London, England.*

A Study of the Properties of 0.5% Chromium—0.5% Molybdenum Pipe Steel, by R C Füsgerald, Consolidated Gas Electric Light & Power Co; A B Wilder, National Tube Co; C V Smith, U. S. Steel Corp; and A E White, University of Michigan. Since the occurrence, early in 1943, of severe local graphitization and failure of a welded joint of molybdenum steel in a high-

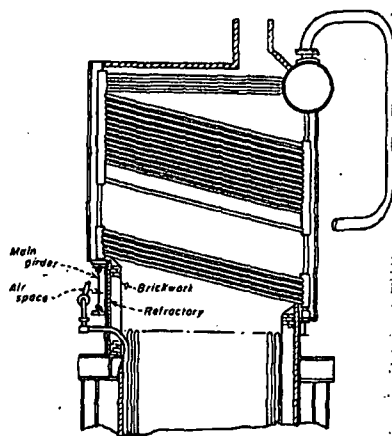
pressure steam line at the Springfield Station of the West Penn Power Co, metallurgists and engineers have expended considerable effort in studying the fundamental factors involved in the reversion of carbide to graphite, and developing alloys and manufacturing practices that will inhibit the formation of graphite during commercial usage.

Of the several changes proposed to minimize or prevent graphitization, that involving the alloying addition of chromium has generally been considered the most effective. The cooperative study reported in this paper was undertaken to test this possibility. An arbitrary chromium addition of 0.5% (to the 0.5% molybdenum level commonly used for steam pipe) was selected.

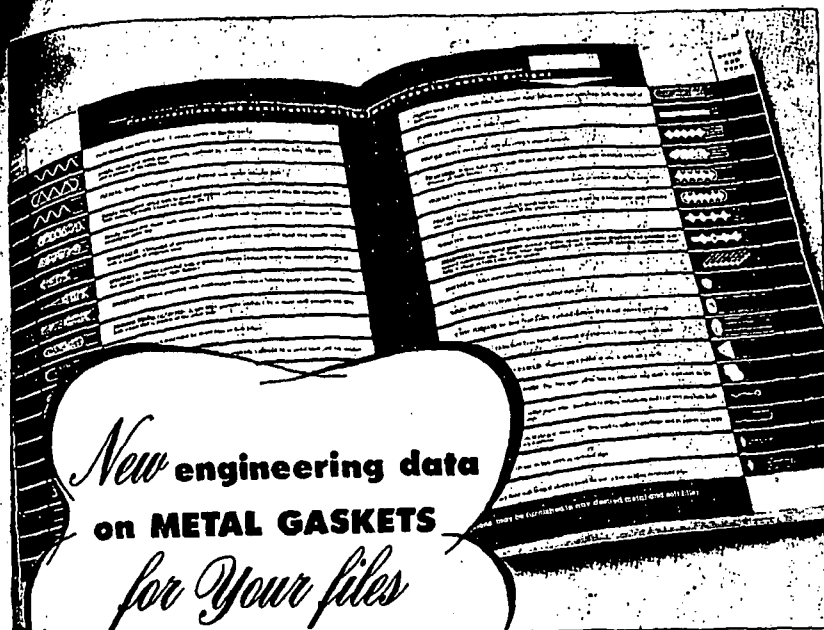
Two heats of commercial size, which cannot always be approximated by small experimental or laboratory heats, were employed for the tests. These were rolled into 10 $\frac{3}{4}$ in. by 1.125-in.-wall seamless pipe. The two heats were nominally identical except for the decarburization practice employed, one being made to coarse-grained, the other to fine-grained practice. The coarse-grained



1 Built-up I-section (above) is the main girder. Corrosion reduced vertical web plate $\frac{1}{2}$ to $\frac{1}{8}$ in.; wasted stiffeners



2 Main girder (right) opens on the fire side behind a metal casing. Poor ventilation plus flue gas ate away the girder



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