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Artikel: Experience obtained with structures executed in Finland

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Experience obtained with Structures Executed in Finland.

Erfahrungen bei ausgeführten Bauwerken in Finnland.

Observations sur les ouvrages exécutés en Finlande.

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Arc welding was already adopted in Finland in 1901 in the only locomotive works then in the country. Welding was done with 20—30 volts, and the electrodes were of mild steel or S. M. steel, 6 mm thick. Gas and air containers, and also locomotive and railway carriage fittings were produced. At present this locomotive works has 11 d.c. and 1 a.c. machines.

Arc and fusion welding are at present widely used in the country. The engineering industry works principally for the pulp and paper-making trades, which are the most important in Finland. Consequently, among welded constructions are to be found weir plants, roller weirs, weir bridges, turbines (Figs. 1 and 2), decorticating drums, and washing vats for paper making (Fig. 3).

In structural work, principally roof construction and pylons are welded. Fig. 4 shows a type of railway platform roofing of which several have been erected since

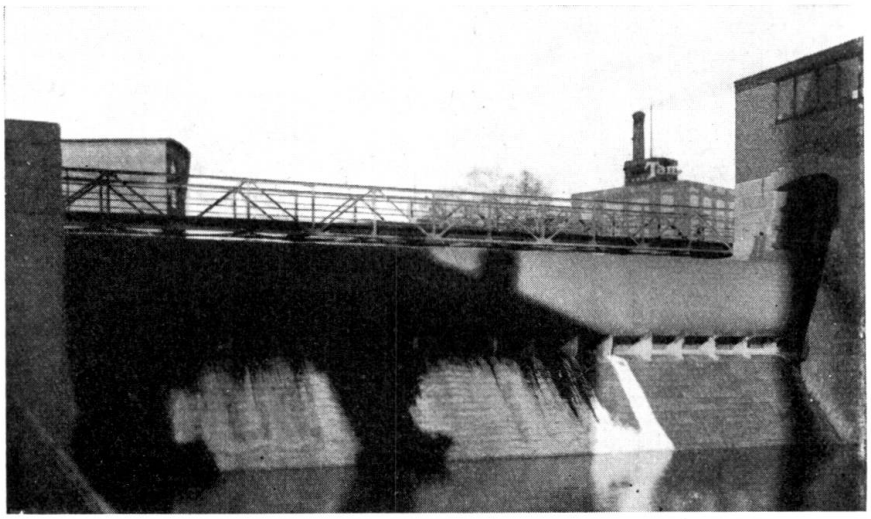


Fig. 1.

Hydro-electric plant at Tampere.
Bridge span 25.5 m, width 2 m. Roller weir entirely welded.

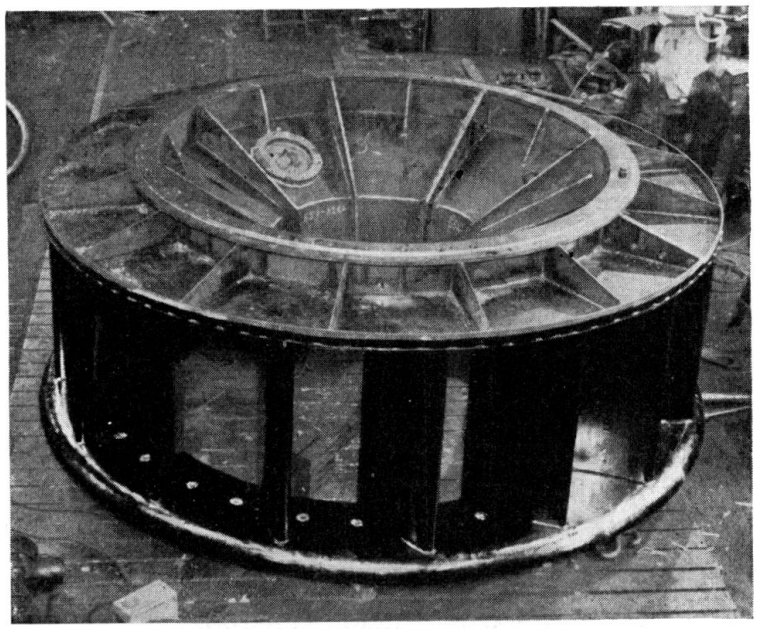


Fig. 2.
Turbine rotor.

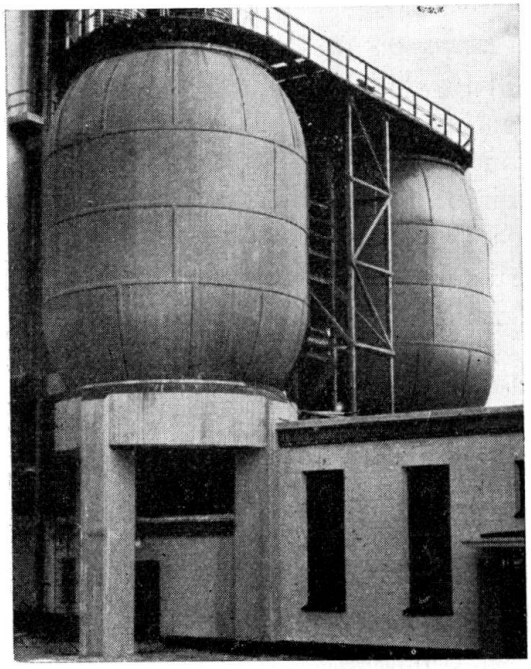


Fig. 3.
Storage tank for acid at a pulp factory.

Fig. 4.
Platform roof.

1933. The erection joints between supports and trusses are riveted; because of the rough climate, erection joints are very rarely welded.

Figs. 5 and 6 show the first, and up to now the only, completely welded railway bridge, erected in 1933, with a span of 12 m. The calculations were made according to the regulations of the German Railways then in force. The bridge has proved very satisfactory up to the present.

There are no particular features to mention regarding methods of working. Long joints are first of all tacked at intervals and then welded from the middle

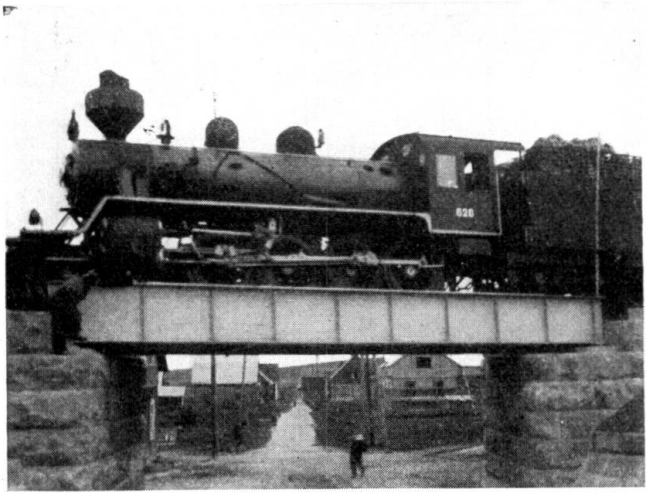


Fig. 5.
Railway bridge, 12 m span.

to the ends. For connecting thick plates, U- and V-joints have been used, the latter with an opening of 60°. In these joints the welding is tested with a pneumatic hammer after each layer of weld metal has been applied.

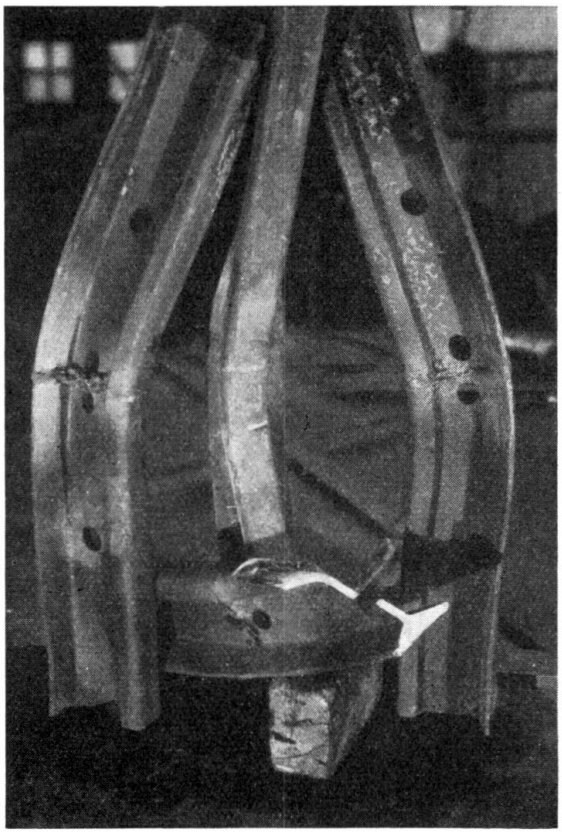
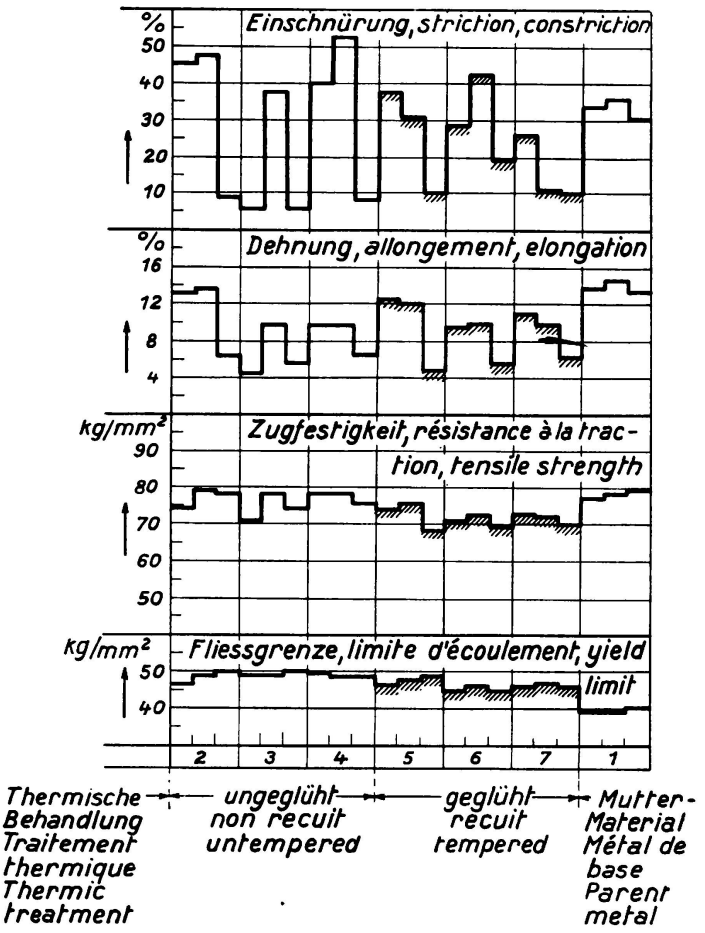


Fig. 6.
Welded rails, bent cold.

The Finnish State Railways use electric resistance welding on the flash method, for welding about 1200 tons of old rails per annum. The parts to be welded are annealed first. Such rails have proved excellent in service; up to now no single

breakage has been found, either in the weld itself or in its immediate neighbourhood. Fig. 7 shows cold bent rails, and Diagram 4 the test results.



After the welding regulations common to 20 countries were issued in 1934, the Finnish Standards Commission published their standards in 1935. Only a few additions under "Special Cases" were added to the International Standards, to comply with home requirements.

Finland has no special stipulations with regard to calculation and construction. The general rules for structural steelwork permit welded joints if they are made carefully by trained men.