

# Glimpses of the Past

by George Toms

## 9. The Brush Ljungström Saga

The Falcon Works was founded and raised on engineering work concerned with steam engines, whether that work concerned portables, pumps, locomotives or after the arrival of the Brush company reciprocating engines used as prime movers for AC or DC generators.

It was still common during the 1880's for machinery to be driven from a steam-powered engine through a belt drive. Many a Brush dynamo was coupled to its drive in such a manner, but before the company came to Loughborough in 1889 it was already utilising directly-coupled drive Brush steam engines and certainly by 1892 was assembling its own designs in the Locomotive Erecting Shop at the Falcon Works.

As the outputs and physical sizes of generators grew so did the prime movers. In 1902 a new vertical reciprocating steam engine was introduced. It was suitable for triple-expansion working, high speed, and for two or three cranks. The first example of 500 h.p. went into operation in the September. At the same time it was recognised that steam turbines probably had an important place in the future of electricity generation. A licence was obtained to make turbines under Parsons patents.

The Brush "Universal" engines introduced in 1895 were replaced by the new Brush design and the Parsons turbines. Business grew, then was hampered by a fall in trade and competition, but revived by 1911 to increased demand. Indeed two years work was in hand.

Then, in 1913, the Chairman Emile Garcke announced that Brush had acquired the manufacturing and selling rights of the Swedish Ljungström Turbine, upon which great hopes were placed. The stated advantages of the design were that it was fully protected by patents, original in design and cheap to manufacture, and had merits in advance of other machines of the kind in the market.

That year a Swedish-built unit went into service at a Willesden power house, followed by the first Brush unit for St. Pancras early in the following year.

1914 brought war and the modest start on Brush-Ljungström turbines faltered due to war priorities and difficulties due to delayed installation of new equipment for manufacturing them due to obtaining

theless, in 1917 the first marine propulsion application of the Brush-Ljungström turbine was demonstrated when the Wolstey Castle was fitted out. Loughborough Power Station also received Brush-Ljungström turbines during the war period, one of which was preserved at the Falcon Works before passing to the Museum of Technology at Leicester.

After the end of hostilities in November 1918 Brush started to re-adjust production to peacetime products. Extensions to the turbine shop were put in hand and at last the pent-up demand for the outstandingly successful Brush-Ljungström turbine could be faced with confidence. Hitherto most turbine activity had been concentrated in the Heavy Machine Shop (now 18 Shop) with the testing facilities being based at the railway end of the shop adjacent to the boiler house and the power house, but soon a new facility was to be made available.

An extensive profit was made during 1920 and a share issue raised more cash to expand the volume of business and fund new buildings. One such building was the new turbine shops (now 24 Shop), purpose-built for production of turbines of 3,000kW and over. It was completed in 1923 and was an impressive boost to the range and quantity of turbine production at the Falcon Works.

By 1924 the Brush Ljungström sets were reaching outputs of 7,000kW. There was a need to combine a policy of higher output to make existing power stations more efficient through savings on fuel costs using Brush-Ljungström turbines and to pursue the export market with more vigour and emphasis. This was so because a change in policy by the Electricity Commissioners tended towards fewer but more powerful stations rather than a multiplying of smaller ones – the first steps towards a grid system.

By 1925 the above policy was proving to be a difficulty for Brush and the power output of the Brush-Ljungström range was increased to 10,000kW. By 1928 it was 12,500kW and by 1930 15,000kW and above were being considered against a background of poor trade and economic depression together with the growth of a national electricity grid system. Brush was prepared to build 50,000kW to 60,000kW units to meet new require-