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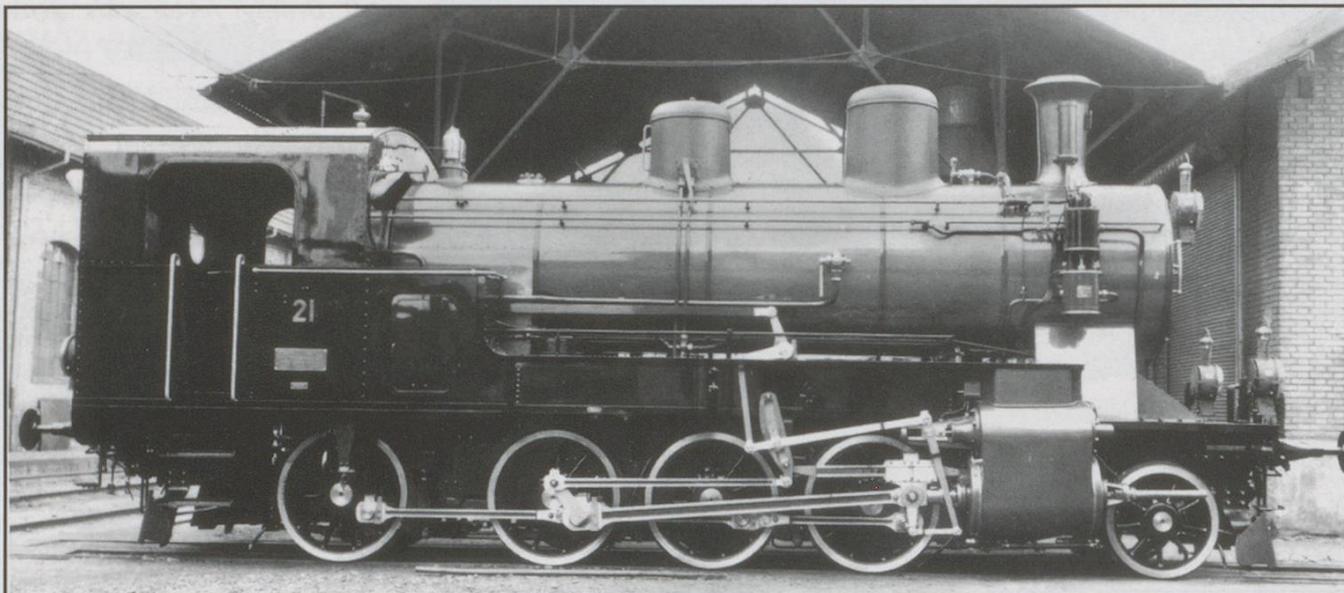
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**PART 4 - SÜDOSTBAHN  
MIXED TRAFFIC LOCOMOTIVE TYPE Ed 4/5**



*Ed 4-5 No 21, Works photo. Courtesy: SLM*

**THE RAILWAY COMPANY.**

The Schweizerische Südostbahn was formed, in 1890, by the amalgamation of the Wädenswil-Einsiedeln Bahn and the Zürichsee-Gotthardbahn. The primary function of this new railway was to connect Wädenswil - and in 1901 Pfäffikon - to the Gotthard line at Arth-Goldau. When the WEB was formed passengers from Zürich were brought to Wädenswil aboard the company steamers *Wädenswil* or *Speer*. The route with its ruling gradient of 50‰ and minimum radius of 130 metres presented quite a problem for the motive power. Cantonal Engineer Kaspar Wetli designed a rack system for the WEB line, which comprised diagonally placed rails formed into a large "V" installed in the steepest section of the track. However, trials with adhesion only locomotives proved to work well so the plan was not developed. The new SOB line also proved taxing on the motive power as it too had gradients up to 50‰.

**THE LOCOMOTIVE.**

The locomotive manufacturer SLM in Winterthur was requested in 1909 to supply two

locomotives able to haul a trailing load of 120 tonnes at 30 km/h over the route from Rapperswil to Arth-Goldau. The 49 km long route consisted of, for the main part, level track or gradients up to 30‰ but 7.5 km of the route was at 40‰ and a further section measuring 13.9 km was at the maximum gradient of 50‰.

SLM produced, in 1910, a tank locomotive with four coupled axles measuring 11 000 mm in length able to develop 880 HP at 25 km/h. The inside frame consisted of folded 28 mm thick steel plate. Water storage was in two small side tanks - capacity 5.2 m<sup>3</sup> - located just in front of the drivers cab and the 1.6 tonnes of coal stored in a bunker on the rear bulkhead of the cab. Sand stored in a large dome on top of the boiler behind the steam dome, was fed to the centre two axles.

The 4 000 mm long boiler operated at 12 bars and was protected by two pop valves located just in front of the driving cab. Superheated steam at 300° C was fed from the 18-tube Schmidt superheater via a double slide-valve regulator which supplied two horizontally mounted cylinders. The cylinders measuring 500 mm in diameter with a stroke of 600 mm were controlled by Walschaerts valve gear and powered the third of the four coupled driving axles.

Speed indication was according to the Hasler system, the brakes operated on all driving axles via a screw handle or the double action Westinghouse air-brake system. The locomotive proved to be very economical in that it consumed just 55 kg of coal per 1 000 gross-tonne-kilometres, which was superior to that of the smaller SOB E 3/3 locomotive. After many years of satisfactory service the SOB requested SLM to draw up plans for an improved locomotive in order that heavier trains could be hauled over the line to Arth-Goldau. In 1934 SLM responded with two proposals, one based on the Ed 4/5 in the form of a 1-C-1 and the other was based on a Thunersee Bahn loco and was designated as 1-D-1. However progress overtook the plans as electrification came on to the scene and the SOB had chosen to proceed along that path rather than spend money on more steam locomotives.

The service life of number 21 ended in 1939 due to the electrification of the route with number 22 following in 1940. The locomotives were placed on the market and sold to Krupps of Germany in 1941. On the 26th February 1941 along with several of their sister locomotives from the Class E 3/3 they were hauled by SBB locomotive C 5/6 No.2961 to Basel Badischer to be handed over to the DR. In 1949 both locomotives were sold by Krupps Steel to the Osthannoverschen Bahnen [East Hannover Railway] for service on passenger traffic where they served until 1961 [22] and 1963 [21]. After that they were sent for scrap.

*References used:-*

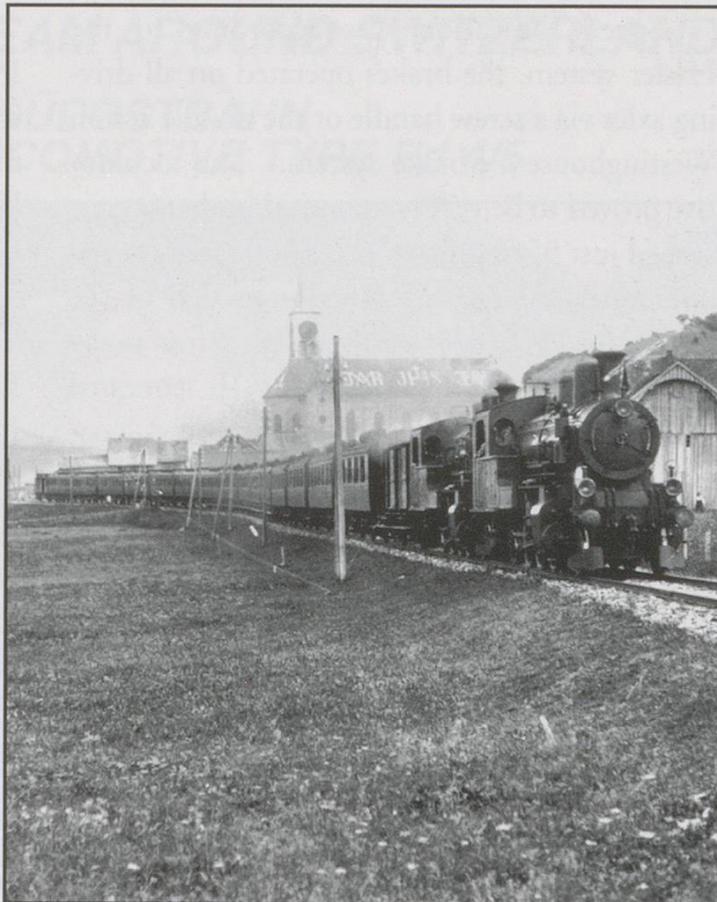
- *Der Dampfbetrieb der Schweizerischen Eisenbahnen. 1847 - 1922. Moser.*
- *Die Südostbahn, Geschichte einer Privatbahn. Gerhard Oswald.*
- *SOB Documents.*



*Ed 4-5 Near Rabennest Tunnel.  
Courtesy: Hurlimann/SOB*

## LOCOMOTIVE DATA.

**Type** Ed 4/5, 1-D  
**Nos** 21 - 22  
**Built by** SLM Winterthur **Works No** 2091-2  
**Date built** 1910  
**Power** HP880 @ 25 km/h kW647 @ 25 km/h  
**T/E at wheel rim.** 9 500 kN  
**Date in Service**-1910 **Date out of service**-1940  
**Max. Speed** 50 km/h  
**Speed Indicator** Hasler  
**Driving wheels**  
Diameter 1 130 mm  
Wheelbase Rigid 2 650 mm Total 6 810 mm  
Overall length 11 000 mm Height 4 300 mm  
**Loco weight**  
Empty 48.0 Tonnes Service 59.4 Tonnes  
Adhesion 52.0 Tonnes  
Water capacity 5.2 m<sup>3</sup> Coal capacity 1.6 Tonnes  
**Brakes**  
Mechanical-Screw Automatic-Westinghouse double action  
**Cylinders**  
Number High pressure 2  
Bore 500 mm Stroke 600 mm  
**Boiler**  
Operating pressure 12 Bars Length 4 000 mm  
No. of Tubes 112  
Firebox 27.5 m<sup>2</sup> Grate area 2.1m<sup>2</sup>  
Superheater type-Schmidt No. of Tubes 18  
**Trailing load**  
Gradient 50‰ 120 tonnes @ 30 km/h  
**Construction**  
Cost SFr 74 100



*Above: 2 x Ed 4-5. At Rothenthurm 1915*

*Photo: Courtesy SOB*

*Below: Ed 4-5 No21-22 Hauling an express at Samstagern.*

*Photo: Courtesy SOB*

