Steam around Switzerland. Part 10, Waldenburgerbahn G 4/5

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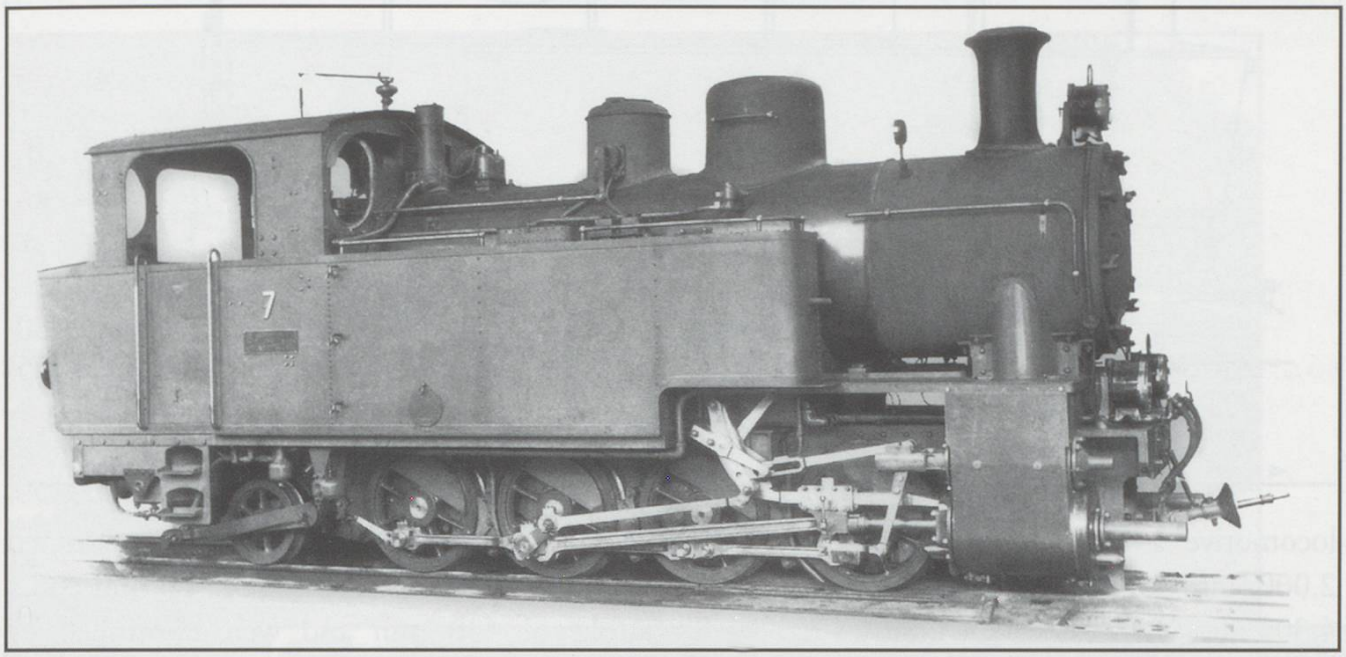
STEAM AROUND SWITZERLAND
PART 10. WALDENBURGERBAHN G 4/5



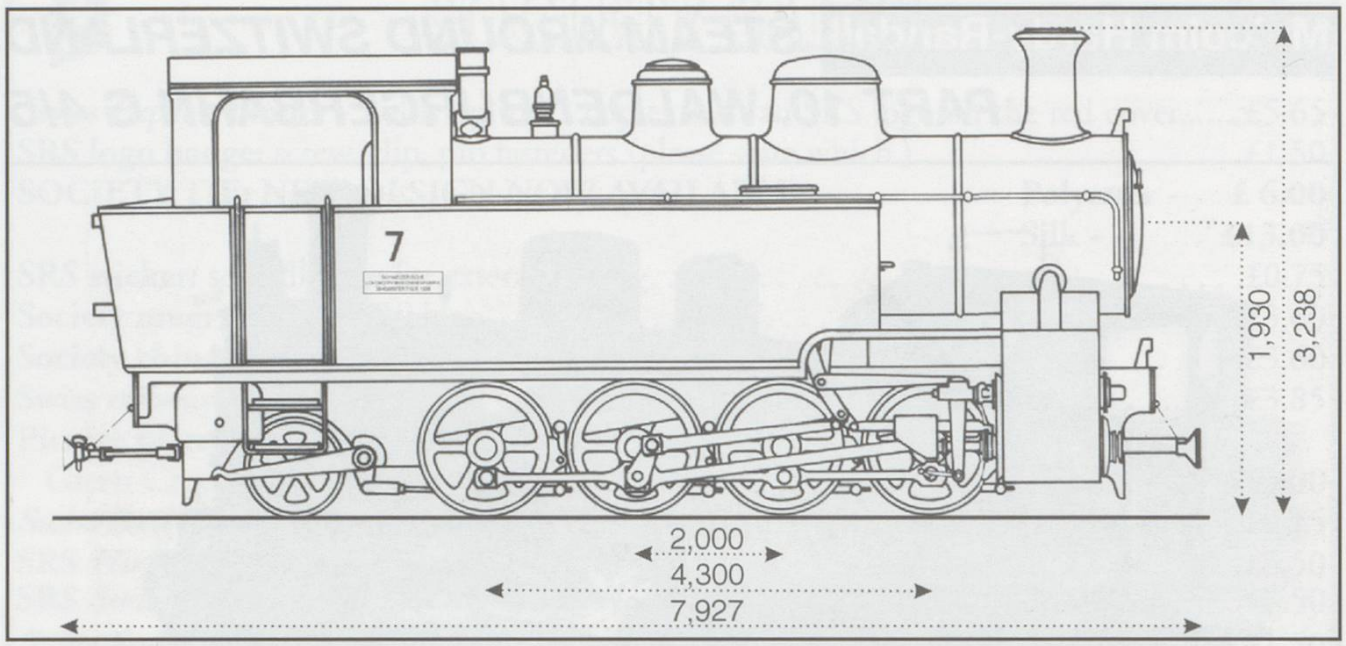
Waldenbugerbahn. Locomotive type: G 4/5. No 7. Courtesy SLM

The Waldenburgerbahn company was formed in 1870 and received a concession to operate a railway system from Liestal in Canton Basel along the Frenk river valley and up the mountain to the town of Waldenburg lying 15 km away. It was proposed to tunnel through the mountain from Waldenburg and connect up with the planned SCB standard gauge line from Liestal to Balsthal via the proposed Wasserfallen tunnel. The SCB withdrew the plans in favour of the Hauenstein line, and so the Waldenburgerbahn terminated at Waldenburg. The first trains between Liestal and Waldenburg ran in November 1880 but by 1936 the company had a dilemma on its hands.

The current fleet of steam locomotives - 4 type 3/3's - were not able to cope with the demand. The company had to choose between closing the line and using buses over the route or electrify the line. The first of the choices was unthinkable and the second was far too expensive. So after a special general meeting and much deliberation the company board chose to purchase another steam locomotive that was able to haul heavier trains comprised of new four axle passenger coaches which also had to be ordered. On the 28th April 1937 an order was placed with SLM of Winterthur for the supply of a G 4/5 locomotive.

The 750 mm gauge route had minimum curves of 57 metres radius as well as gradients up to 38 per mille, which put limitations on the design of the locomotive. The G 4/5 locomotive arrived from SLM on the 19th May and was put under final test by the Control Engineer Friedrich Hunziker on the 31st May, who gave his approval for it to be placed in service the following day. An axle load limitation of just 7 tonnes on such a large engine gave the designers at Winterthur a serious problem, but it was achieved. The WB gave the locomotive the stock number of 7 but in a break from tradition did not give it a name.

The achieved tractive effort - 5,400 kg - of the G 4/5, 2.5 times that of the G 3/3 engines, gave it the power to haul a trailing load of 100 tonnes at 25 km/h over the line. To accommodate the small radius curves on the route the axles numbered one and four were designed with a lateral movement of 15 mm, giving the



locomotive a fixed driver wheelbase of just 2,000 mm and a total driver wheelbase of 4,300 mm. As all steam locomotives ran down the mountain from Waldenburg to Liestal in the cab forward mode, the carrying axle under the drivers cab was able to provide extra stability on the higher-speed downwards run.

The 2,600 mm long boiler operated at 14 bars and was provided with two pop-safety valves located on top of the firebox. The boiler was fitted with 68 tubes that provided wet steam to the Schmidt 18-tube superheater unit, from where superheated steam was fed via a slide regulator to the two outside mounted cylinders. These had a bore of 360 mm and a stroke of 430 mm and were controlled by Walschaerts valve system. Power was fed to the third of the 850 mm driving wheels.

On the rear of the large fully enclosed driving cab was mounted the coal storage bunker with a capacity of 1 tonne; water was stored in two side mounted tanks that had a total capacity of 4 m^3. The locomotive was fitted with the SBB improved combustion system, Hasler speed indicator, lubricating system and a flange lubricating assembly. An automatic vacuum brake system according to the Hardy principle was fitted. Electric lighting was provided with a backup battery system.

The G 4/5 quickly achieved the title of "problem child" as the axle boxes, tyres and flanges showed considerable wear. The locomotive was relegated to use at weekends plus heavy military traffic during the period of the Second World war. During the five year period from 1941 to 1946 the tyres were replaced four times. The axle boxes had to be replaced on an annual basis. Because of the light use of the G 4/5 it only achieved a running figure of 277,938 km during the fifteen years it was in service.

A major overhaul lasting ten weeks took place in 1946 in which many parts were

Locomotive Data.

Type	G 4/5	No.7
Built by	S.L.M. Winterthur.	
Works No: 3646		Date built: 1938
Power HP: 370		Power kW: 272
T/E at wheel rim. kN: 52.97		
Date in service: 1938		Date out of service: 1960
Speed maximum km/h: 45		Speed Indicator: Hasler
Driving wheels		Diameter mm: 850
Rigid Wheelbase. mm: 2,000		
Total wheelbase. mm: 4,300		
Length overall mm: 7,927		Height mm: 3,238
Loco weight.		
Empty Tonnes: 24·4		Service Tonnes: 31·7
Adhesion Tonnes: 27·3		
Water capacity m^3: 4		Coal capacity Tonnes: 1
Brakes	Vacuum. Hardy semi auto.	
Cylinders: Number High Pressure: 2 Outside.		
Bore mm: 360		Stroke mm: 420
Boiler: Operating pressure Bars: 14		
Length mm: 2,600		Tubes: 68
Superheater Type: Schmidt.		Tubes: 18
Heating area m^2: 14·1		Firebox m^2: 4·8
Grate area m^2: 1·0		Total heating area: m^2 60·5
Trailing load: Gradient 30 ‰: 100 tonnes @ 25 km/h		
Construction cost SFr: 84,000		

replaced and the locomotive left the workshops as good as new, again in 1950 the same type of overhaul took place. All this major work in so short a life must have placed a huge strain on the budget of the railway company.

On the 25th October 1953, the day the electric service commenced, the G 4/5 along with the other steam locomotives in the class G 3/3 were placed in reserve. It was a decision of the board that the technically unique G 4/5 should be put up for sale, but after seven years no buyer had been found and the scrapping of the locomotive was proposed.

After a fruitless search for a buyer the Waldenburgerbahn took the locomotive into the depot and cut it up into sections that could easily be handled by a scrap metal dealer from Zürich.

ABOVE: Waldenburgbahn type G 4/5. Courtesy: WB Archives

BELOW: G 4/5 on a freight at an unidentified location. Photo: ©A. Amstein

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