

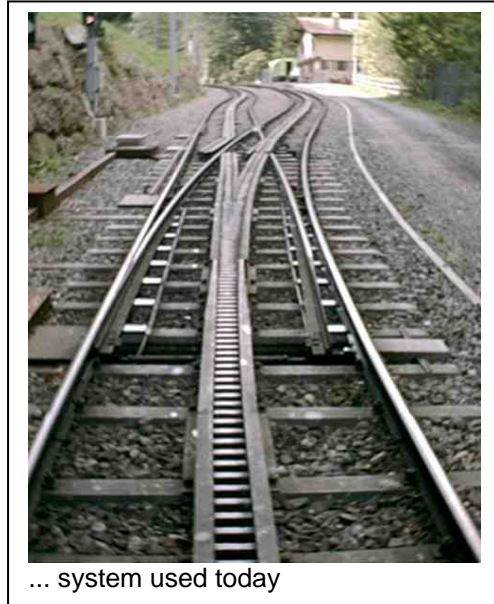
New special *flexible* rack railway turnout, Rigi-VTW 2000

Why a new point system?

In rack railway systems the areas operations and engineering are particularly cost intensive. For a number of years Rigi Railways has been looking actively for new solutions to reduce these costs.

We have conducted a number of system studies to investigate among other areas, the rack technology. This included the braking of taboos, after all the rack railway system was developed more than two centuries ago and has been running for 129 years without major changes. The genius of Niklaus Riggerbach (Builder of the rack railway to the Rigi) was unequalled. The long survival of rack railways is no coincidence. Despite of this, us engineers of today have to properly question the validity of existing systems. The modern and fast moving market forces us to move to highly flexible and efficient working methods. New ideas for introducing suitable production systems are required.

Within our system and many other mountain railways turnouts with racks and switchblades with sliding sections are in use.



In our search for systems improvements we have already in 1988 developed the first ideas for a „flexible spring point“. As an idea alone is insufficient, Rigi Railways looked for suitable partners who would be prepared to convert the idea into action

The two partners Verkehrs- und Industrietechnik AG - www.vtag.ch - in Steinmaur, Switzerland and the Technology concern Windhoff in Rheine (D) - www.windhoff.de - were prepared to develop a new FLEXIBLE Point for our rack railway, together with Rigi Railway. The system has been patented world wide.

The project obtained scientific support from the Swiss Federal Institute of technology Zurich ETHZ, Institut for transport planning IVT - www.ivt.baum.ethz.ch .

Such, after a 10 year maturing process the RIGI-VTW turnout (RIGI-Bahnen, VT Verkehrs- und Industrietechnik AG, Windhoff AG) was created.

The three partner were searching for a construction to meet the following specification:

- More cost effective to purchase
- More cost effective in operation and maintenance (minimal lubrication – more ecological)
- Simple transparent construction
- Few moving parts and joints, therefor less wear and tear.
- No speed restriction accross the point
- Mostly mechanical snow clearing
- No or minimal heating requirements in Winter
- Single rack
- Old historical vehicles with parts protruding below the the running face of the rail can use the system without problem
- Only one single point of instability, therefore high degree of travel comfort and reduced wear on the vehicles
- High system accuracy in the area of the single rack connection point
- Execution without frog possible, therefore eliminating a further point of instability and risk of derailment.
- Allows connection of more than two tracks

How does the new point work?

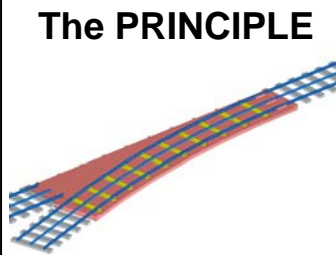
The Spring point is based on the idea of a „cut“ track, which as a „spring“ fixed in one point is bent along a predetermined curve from one endposition to the other. In the endpositions the system can be considered a „closed“ track. The movable trackbed is protected from lifting and kinking with special constructional elements.

The advantages as compared to the standard system with switchblade and sliding elements are obvious.

The system has applications for the following rack- and adhesion railways:

:

- Connection to two, or more tracks
- Where no switchblades, frogs and other movable elements providing instabilities are desired.
- As alternative for complex track changing systems



A single sided fixed movable frame (rails + rack + gaugefixation) slides on a upper frame. In the endpositions, the system is locked and supervised.

Technical Data

Description	Special flexible rack railway turnout
System	RIGI-VTW
Gauge	1435 mm / Standard
Length	19.4 m
Opening	6° right/ 9° left (opening freely selectable)
System weigh total	20 Tons
Rail material	Standard rail (Rail VST36, Lamellen-Rack b=60mm, fired). Bending within elasticity tolerances
Inclination	10.95%
Point motoer	Hydraulic (Switching-torque 13'500 N)
Mounting	Lose placement in ballast
Heating	Not necessary
Rack	1 pce. Longitudinal compensation with temperature dependant counteracting system
Track stability	Lattitudinally with special frame reinforcement, vertically with down holding system
Controls	Supervision with axle counter Tiefenbach and PILZ-Control
Installation	26. October 2000
Location	Rigi Freiberger, Vitznau-Rigi-Bahn

Goldau, Januar 2001

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Information: www.rigi.ch / www.vtag.ch / www.windhoff.de