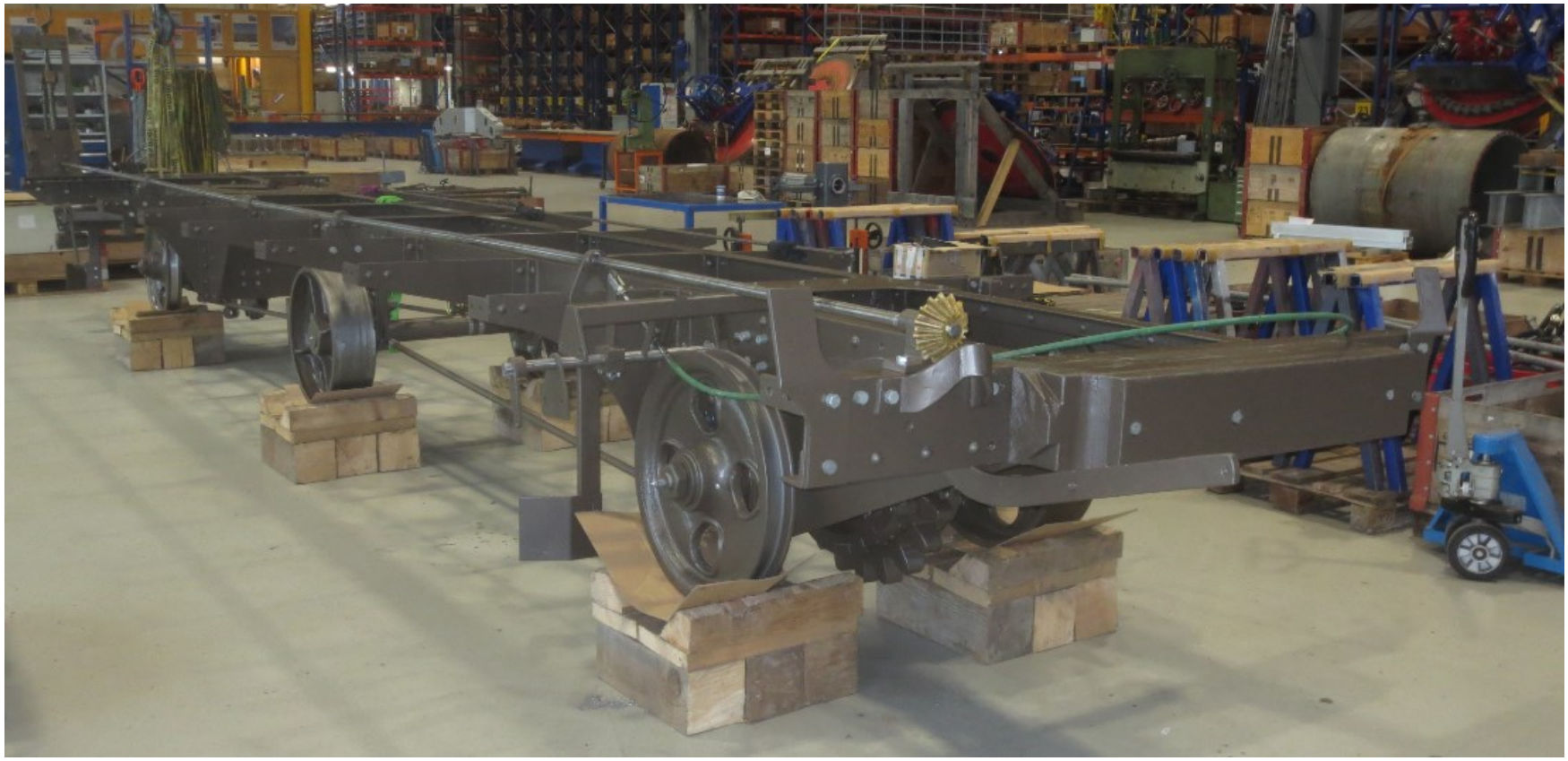
Landmark Giessbach, State 2021

An important maintenance since the Landmark ceremony in 2015 was the **major overhaul of car 1 .**
The upper part was dismantled and the lower frame brought by helicopter into the workshop of «Garaventa AG, Zweigniederlassung Uetendorf» for a **renewal** of used or worn out parts. All parts were sand blasted and received **new paint**. The accessibility in the workshop allowed an **additional insight**, which was not possible during the landmark brochure preparation.
The **wooden superstructure** of the car was renewed in the historic open style and it got another paint, **which is believed by the preservation authority to be the initial one**. Indeed these open cars fit best into the measures taken against the Covid virus since 2020

Nowadays there are two **teeth wheel brakes** acting to the **cog rail**. The upper one looks like the initial one, which was used for speed control during operation with the water tanks until 1912. See pictures below in comparison to the initial drawing.
It is clear that the cog rail hardware is still the same as in Abt's time. But it is not clear, which brake parts have been refurbished or replaced. Nevertheless the principle remained the same. Only the function has changed in 1912 in the sense that this brake was no longer used in normal operation. I do not know, when the second brake was added. Both were maintained unchanged, one as emergency brake and the other as parking break.

Here an additional remark on the operation with the water tank based on Abt's papers: In order to reduce the required brake energy in operation Abt considered the kinetic energy of the moving system in the slope design. Instead of keeping the slope constant **he designed the topmost 12 meters slightly steeper and the lowermost 12 meters less steep than average** in order to support acceleration at the begin of a ride and deceleration at its end.

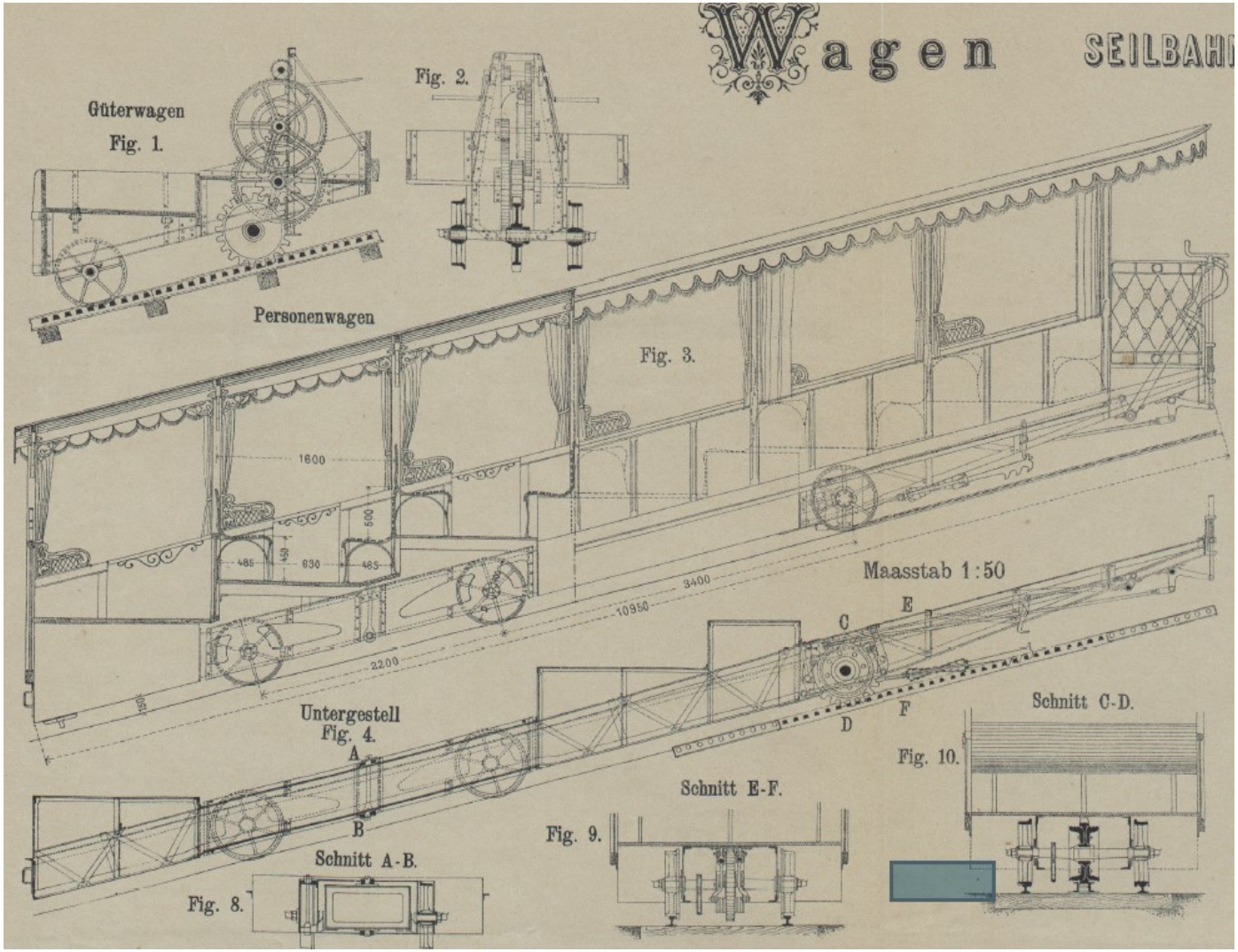
Base Frame in the workshop after refurbishment



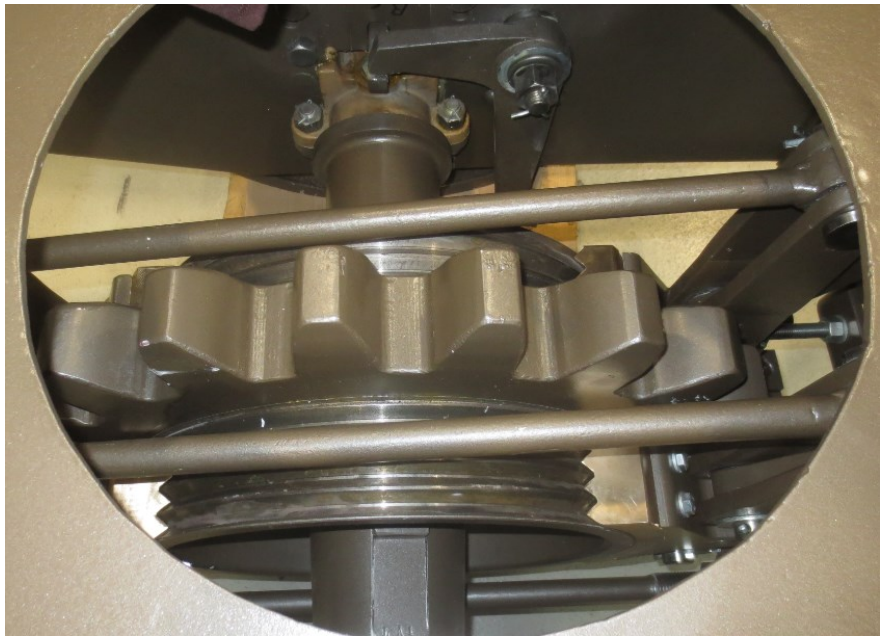
View from the downside end: This is the same **base frame version as modified in 1912**, where the water tanks were removed (by Bell, Kriens) and the lower two axis mounted initially in a bogie were replaced by a stiff arrangement with the **middle axis having no wheel flanges**. All steel parts were sand blasted and have a new paint. Photo HW, 2020-02-25

Initial Base Frame Drawing from Abt‘s publication

This is part of a drawing in Abt’s publication from 1879. The “Güterwagen” upside left was hand operated and used during construction of the track. It does not exist anymore. The car with water tanks had three axis with the lower two assembled in a bogie. The break system acting to the cograil is magnified and commented in a slide below.



Base Frame upper side, break mechanism

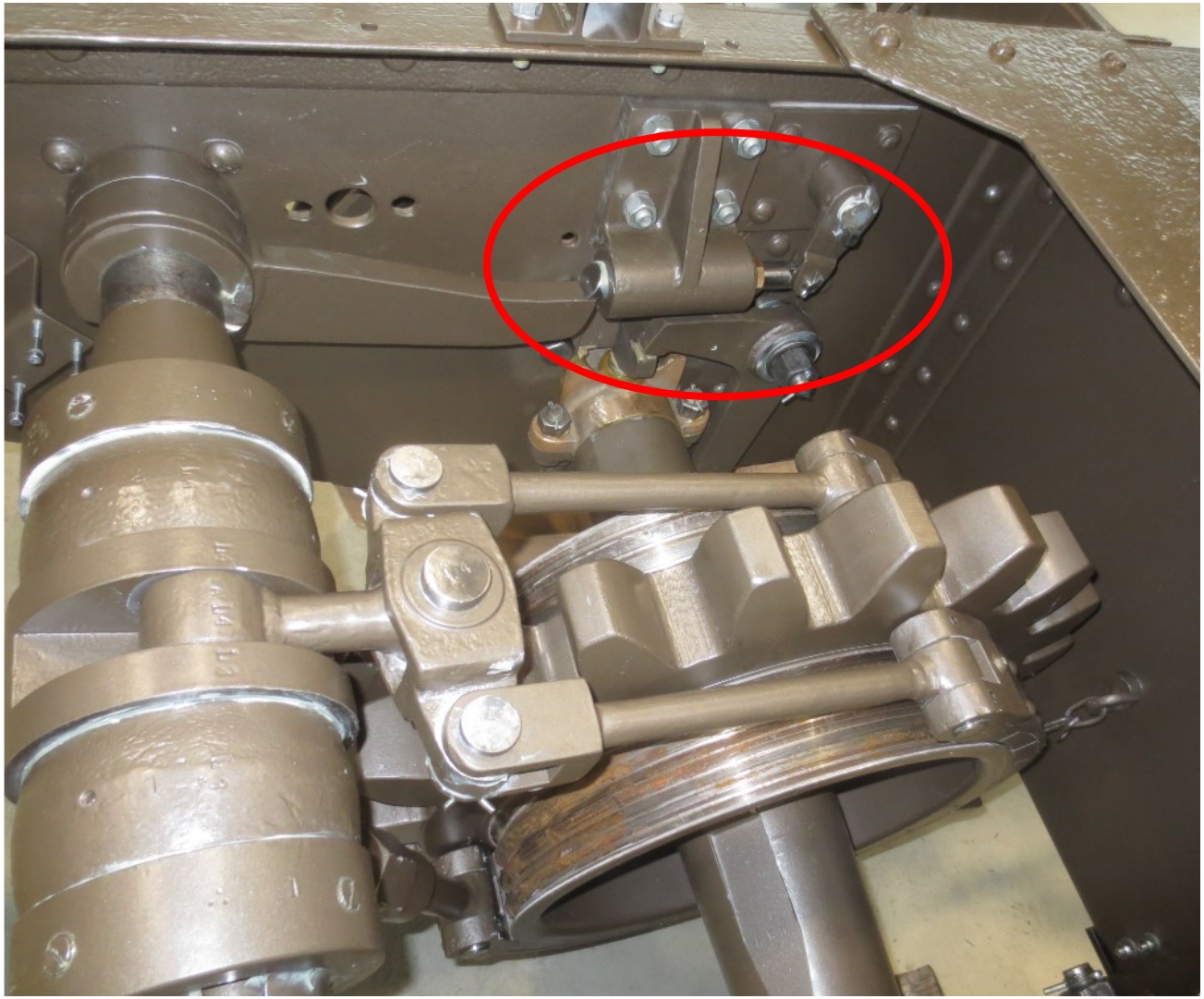


This is the current **parking brake** with the **activation crank**. It acts to the teeth wheel on the mountain side engaged in the Riggenbach-type cog rail. The **key slotted design** corresponds to Abt's drawing shown below. At Abt's time this break was used to control the speed by hand. It had an additional automatic release by slack cable. Abt reports from his experience in operation that half a turn of the crank in one car stops both cars. Since 1912 (?) this (upper) device is only used to block the car for service work while there is a second similar emergency brake added at the lower axis of the car.
Photos HW, 2020-02-25

Emergency brake (lower side of the car)

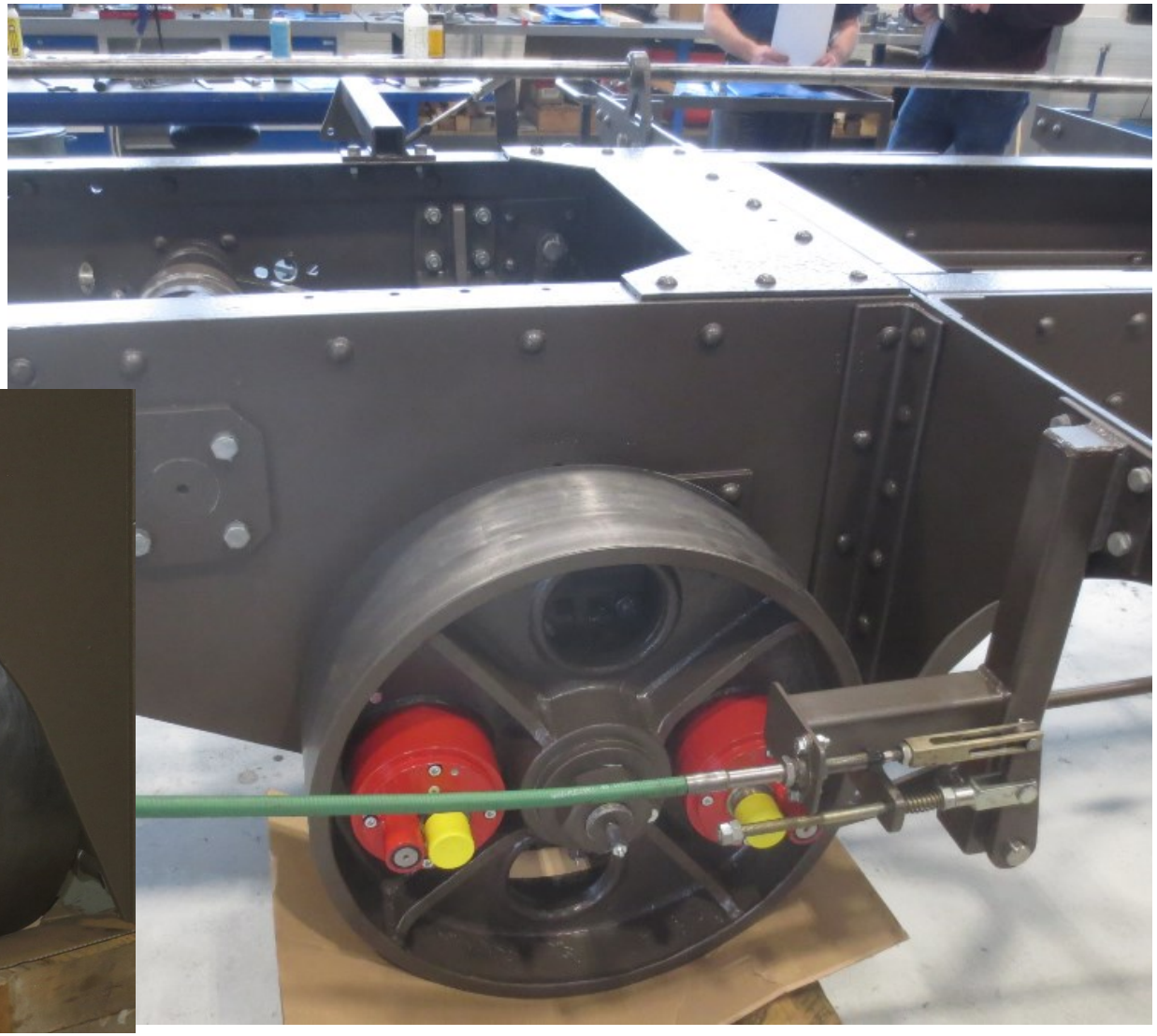
This is the actual band brake at the lower axis of the car. It is weight loaded and it acts via teeth wheel to the Riggenbach –type cog rail.
The emergency release mechanism is marked with red. It is activated automatically either in case of slack cable or of over-speed.
In Abt's drawing of 1879 the brake drum was slotted like the current upper side one. This brake was added in 1912 or later. This drum is smooth as visible here.

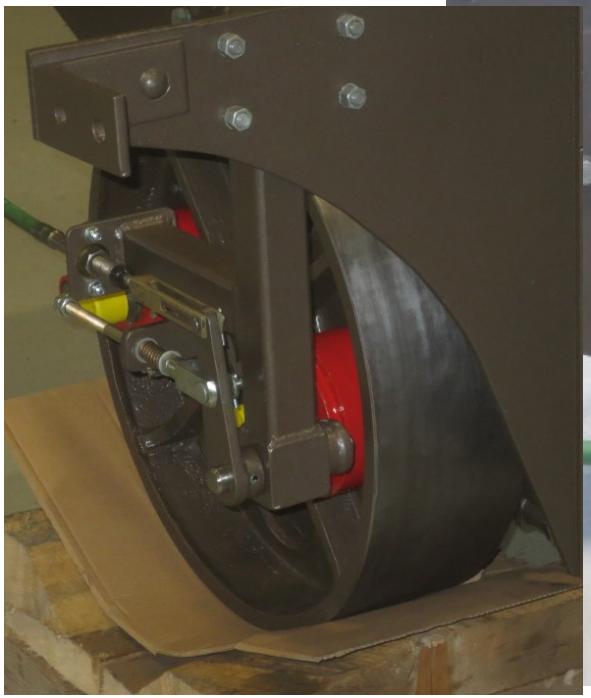
So far no cable rupture has been reported in the history of this installation.
Photo HW, 2020-02-25



Overspeed detector for emergency brake release

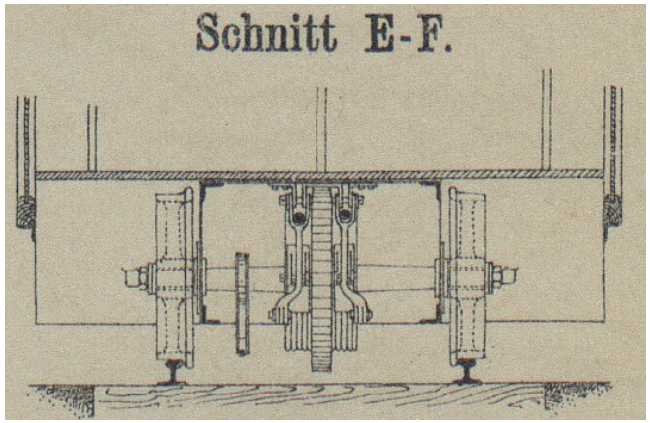
This device was introduced before the actual refurbishment. It is here in the refurbished state.
Photo HW, 2020-02-25

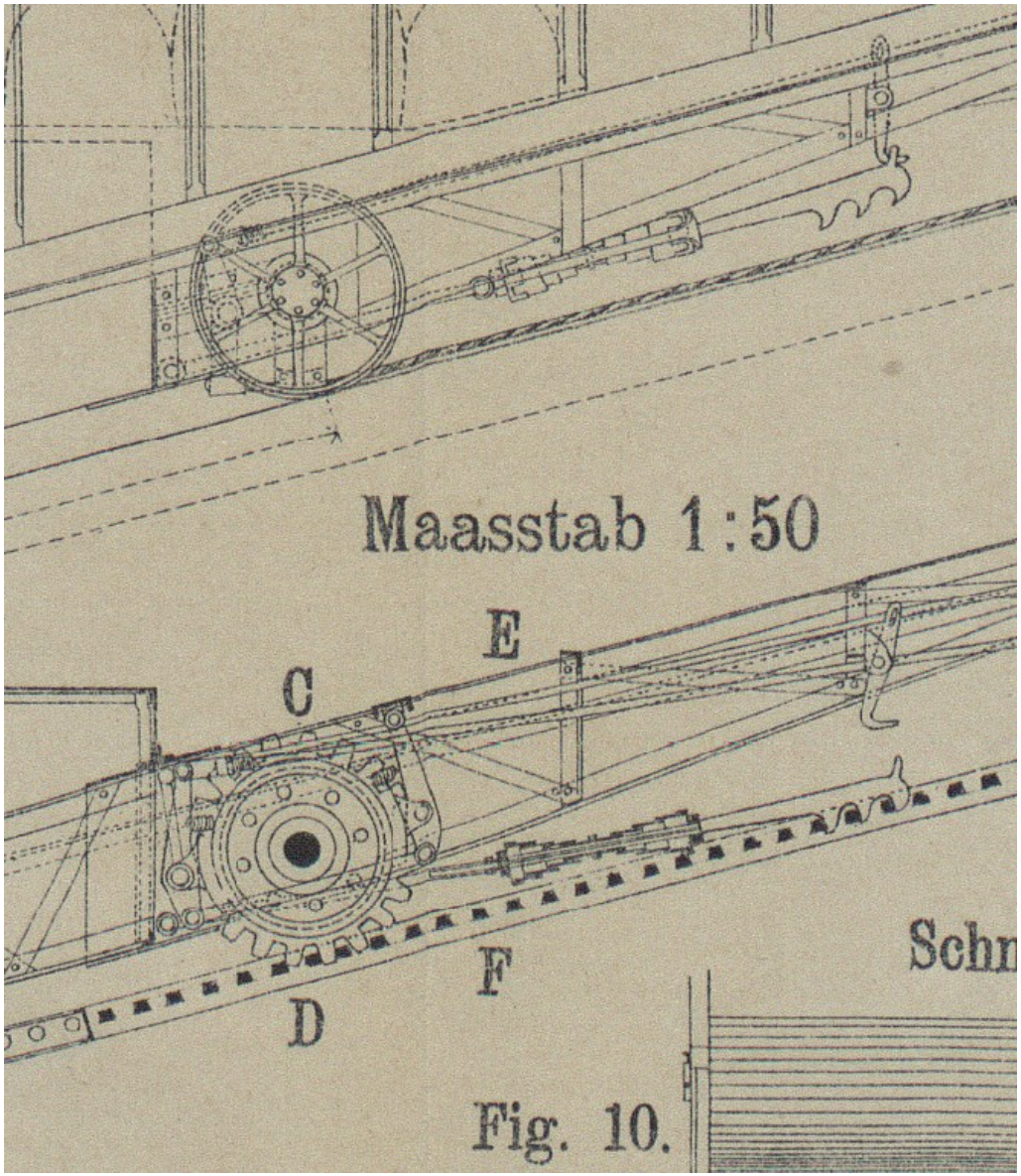




Magnification of Abt‘s break systems

According to the drawing there was only one break teeth wheel as shown here. It was used for speed control in operation by the driver. Nominal speed was **1 m/s**. Abt talks on the case of a cable rupture. He mentions the automatic release of this break in case of slack cable. He mentions aditionally a second **three-hook brake** engaging into the cog rail with automatic release in case of a cable rupture. He considered a spring within the connection to the car in order to reduce the dynamic load. However in another part of the paper he mentions, that this hook device was **not installed**. Thus, it remains unclear whether this was ever installed or not.





Appearance of Car 1 with the new paint

In Switzerland the montain railways are typically red with a few exeptions especially to distinguish two cars. **Car 1** (turning right in this picture) is the renewed one with a painting that is believed to be the initial one. The car 2 in the back is still red. Its renewal is presumably planned for the winter break 2023.

Photo HW, 2021-07-05

The landmark plaque, state 2021-07-05

Photo HW, 2021-07-05