

Controlled Manual Block in Hauenstein Tunnel*

A Swiss Installation Involving the Wheel-Counting Principle Instead of Track Circuit

By T. S. Lascelles

London, England.

THE Hauenstein tunnel in Switzerland is situated on the direct line of the Swiss Federal Railways, between Basle and Olten, and is just over 8 kilometers (5 miles) in length. Steam locomotives at present are operated through it. The two block stations on either side are Olten-Tannwald junction and Tecknau station. The distance between them is too long to form one block section without causing traffic delays and an examination of the conditions showed that the correct point at which to divide the section was in the tunnel, 3,698 meters (12,130 ft.) from the northern end and 4,436 meters (14,550 ft.) from the southern portal. The system of block working in use on this part of the road is the "Siemen's Alternating Current Controlled-Manual," used extensively elsewhere on the Swiss Federal lines.

It was, however, clearly impossible to establish a manual block station in the middle of a steam operated tunnel of such a length, so the administration sought to solve the problem otherwise. It was eventually decided to retain the Siemen's block and to establish additional intermediate signals, electrically controlled, in the tunnel, operating them from the Olten-Tannwald signal tower. Mechanical signals were of course out of the question. It was also necessary to know when a train was standing at these signals and to ensure that no train should be admitted to an occupied block.

Unusual Conditions Encountered

Figure 1 shows the general arrangement of signals adopted. The northbound section is divided at signal A, which is worked as an advance signal from Olten-Tannwald, and the southbound section is divided at sig-

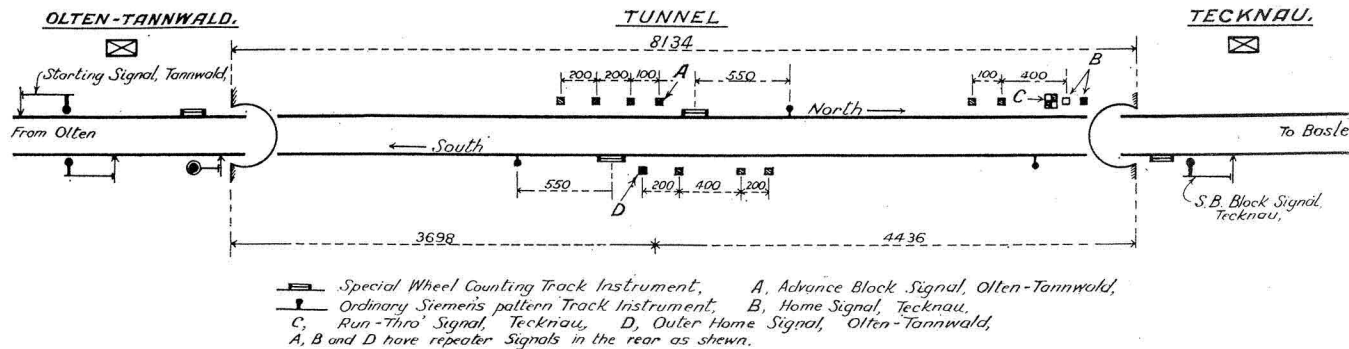


Fig. 1.—Diagram Showing Location of Signals, Track Instruments and Tower

nal D, which is worked from the same tower as an outer home signal. A second train can thus leave Olten-Tannwald when the first has passed and been protected by A, and similarly a second train can leave Tecknau when the preceding one has passed and been protected by D.

*This article refers to the new Hauenstein Base Tunnel, opened in 1916 to ease the gradient to not more than 1 ft. in 100 ft. between Basle and Olten, and should not be confused with the old tunnel opened in 1858 which is only 1 mile 1210 yds.

The home signal at Tecknau, B., and run-through signal C, are also electrical, but the remaining signals are the usual Swiss standard type and worked mechanically. Traffic runs left-handed in Switzerland, but the semaphores, being of German pattern, are right-handed and

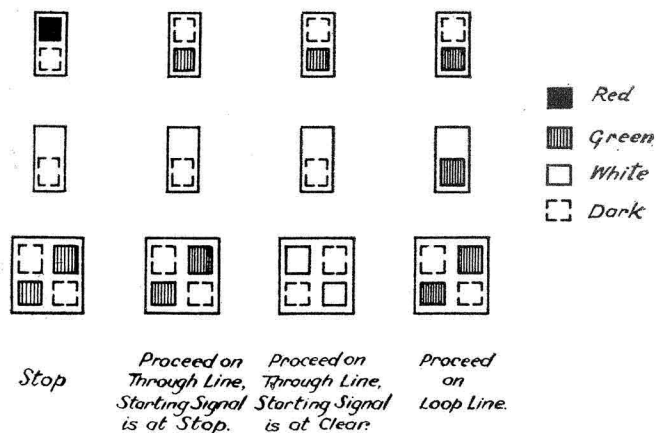


Fig. 2—Indications of Home Signal, Tecknau

point over the track like those used on the Chicago & North-Western. Block and home signals show a red or green light and their repeaters, shown on the diagram, green or white, according to the standard Swiss regulations. Signals B and C show the indications as given in Fig. 2.

It will be evident that it was necessary to prevent the operator at Olten-Tannwald from clearing his northbound

starting signal unless the whole of the previous train had cleared the advance signal A in the tunnel and that signal had been placed at "Danger"—and similarly to prevent his unlocking the southbound block signal at Tecknau until the preceding train had passed entirely clear of his outer home signal D and been protected by it.

The signals are light-signals, shown in Fig. 3, consisting of two incandescent bulbs of 16 to 25 c. p. in alu-

