

that there is no getting round them; the only way to master them is to attack them in front. This the engineers have done. There are five mountain railways in the neighbourhood of the city of Lucerne — the Gutsch, the Burgenstock, the Stanzerhorn, the Rigi, and the Pilatus railways.

The Gutsch, the Burgenstock, and the Stanzerhorn railways are constructed up the face of these mountains; while the Rigi Railway climbs up the back of the Rigi, and the Pilatus Railway, ascending from one side, winds its way round to the back of the Pilatus.

There are several systems of mechanical power represented in these several mountain railways. Two carriages; the descending carriage weighted with water, connected to the ascending carriage by a strong wire rope; the carriages here, as for all mountain railways, being raised behind to a perfectly level floor. A toothed-line of rails running up between the rails on which the carriage travels; and a very powerful and perfect brake, operating upon both ends of the carriage, constitutes the Gutsch railway system. The Burgenstock Railway is worked by electric power. The Stanzerhorn is part of the way worked by electricity like the Burgenstock, and part of the way worked by a cable like the Gutsch. The Rigi and the Pilatus rail-

ways are worked by locomotives. There are engineering reasons why no uniform system has been adopted in dealing with these various mountains.

Pilatus is a very interesting mountain to the sight-seekers who visit Lucerne. From Alpnachstad, the place where the Pilatus



TUNNEL ON
THE
SEMMERING
RAILWAY.

Railway commences, to Pilatus-Kulm, the place where it terminates, the ascent is 5,528 feet. The length of the railway required to make this ascent is 15,020 feet. The average gradient is about 38 in 100.

This railway is a wonderful construction, and as the passengers upon it are borne slowly