Rail gauge

Rail gauge is the distance between the inner sides of the two parallel rails which make up a railway track. Sixty percent of the world's railways use a gauge of 1435 mm (4 ft 8½ in), which is known as the standard or international gauge. Rail gauges wider than standard gauge are called broad gauge, and rail gauges smaller than standard are called narrow gauge. Some stretches of track are built to a dual gauge: that is to say that three (or sometimes four) parallel running-rails are laid in place of the usual two, in order to allow trains of two different gauges to share the same route. The term break-of-gauge refers to the situation obtaining at a place where different gauges meet.

History

Standard gauge was developed by the British engineer George Stephenson, designer of the Stockton and Darlington Railway, who convinced manufacturers to build equipment using the 4 ft 8½ inch (1435 mm) standard. In 1845 a royal commission recommended adoption of the standard gauge, and in the following year Parliament passed the Gauge Act, which required that new railways use standard gauge. Except for the Great Western Railway's broad gauge, few main-line British railways used a different gauge, and the Great Western was finally converted to standard gauge in 1892.

Originally a variety of gauges was used in the United States and Canada. Some, primarily in the north-east, used standard gauge; others did not, including track gauges of up to 6 ft (1829 mm). Given the nation's recent independence from the United Kingdom, arguments based on British standards had little weight. Problems began as soon as railroads began to meet other railroads, and in much of the north-eastern United States standard gauge was adopted. Most Southern states used 5 ft (1524 mm) gauge. Following the American Civil War, trade between the South and North grew and the break of gauge became a major economic nuisance. After considerable debate and planning, most of the southern rail network was converted from 5 ft (1524 mm) gauge to 4 ft 9 in (1448 mm) gauge, then the standard of the Pennsylvania Railroad, over two remarkable days beginning on May 31, 1886. The final conversion to standard gauge took place gradually as track was maintained.

In the nineteenth century, Russia chose a broader gauge. It is widely believed that the choice was made for military reasons, to prevent potential invaders from using the Russian rail system. Others point out that no clear standard had emerged by 1842. Engineer Pavel Melnikov hired George Washington Whistler, a prominent American railroad engineer (and father of the artist James McNeill Whistler), to be a consultant on the building of Russia's first major railroad, the Moscow - St Petersburg line. The selection of 1.5 m gauge was recommended by German and Austrian engineers, it was not the same as the 5 ft (1524 mm) gauge which was in common use in the southern United States at the time. Russia and most of the former Russian Empire, including the Baltic states, Ukraine, Belarus, the Caucasian and Central Asian republics, and Mongolia, have the official Russian measurement of 1520 mm, 4 mm narrower than 5 ft (1524 mm), though rolling stock of both gauges is interchangeable in practice.