

These trains, it will be seen, *correspond in gross weight*: the three feet gauge by its *less* weight of cars transporting about seventeen per cent. *more* productive load than the standard gauge.

On a gradient of 80 feet per mile, gross weight 252 tons:

	Tons.
The 3 feet engine with 70 tons of cars, will haul of coal, . . .	182
The 4 feet 8½ inch engine with 97 tons of cars, will haul of coal, . . .	155

From the foregoing we learn:

First. That an engine of 3 feet gauge can take a *greater number of tons* of freight in its cars against the same grade; and

Second. That it will haul the *same number* of tons of load in its cars up *steeper grades* than the engines of the 4 feet 8½ inch gauge, with its loaded cars, can at all accomplish.

We have shown before that the load of freight on the 4 feet 8½ inch against a $26\frac{4}{10}$ grade is 361 tons, and that this *freight* load can be increased on the 3 feet gauge to 427 tons against a like grade; so also can it be stated that the freight load of 361 tons, not being increased on the 3 feet road, it could be taken by the narrow gauge engine over 33 feet grades instead of $26\frac{4}{10}$ feet. A gain in gradient obtained of 25 per cent. by the adoption of the 3 feet gauge.

So likewise the freight load of the 4 feet 8½ inch engine on a gradient of 80 feet being 155 tons; that of a three feet would be 182 tons. But giving the 3 feet engine the load only of its rival, or the 155 tons, it will transport it over grades of 95 feet, or about 20 per cent. greater.

It seems then clear that while the *steam power* of the 3 feet gauge engine is *no greater* than the other, and keeping the *same paying loads* as the wider gauge, the smaller road can overcome gradients from 20 to 25 per cent. greater.

Under the caption of "Locomotives" will be found some further remarks on the power of narrow gauge engines. We therefore leave this subject for the present.

Seventh. Safety. During the early discussion of the relative merits of the standard and narrow gauge railway, the question as to safety on the narrow gauge was propounded, and it was boldly asserted at the time that it would be extremely hazardous to ride in cars the wheels of which were only three feet

Tons.
1064
900

Tons.
427
361

Tons.
323
273