The action of the severe frosts and rapid thaws distorts the whole structure of the road to such an extent that the English systems of Continuous Bearing, or of cast-iron Chairs with fittings, were alike inadmissible; and it was necessary to adopt a form of great simplicity.

In Appendix X, I give a Statistical Return of some of the principal Railways in the States of Massachussetts and New York, (calculated in my office from official documents), from which you will see that the weight of Rail adopted is greater than on most of those lines.

The rail of 63 lbs. per yard, which is either of the form called the Bridge rail, or that called the single T rail, rests directly on Sleepers, 2 feet 6 inches apart, and is secured to them by spikes. The joints are supported on a wrought-iron Chair, weighing, in some cases, 8 lbs., and in some cases 12 lbs., the former being the prevailing weight.

Simplicity is no doubt thus attained; and from all the inquiries I made, I am led to the conclusion that the arrangement adopted is the one approved by most of the local Engineers: and an identical arrangement has been adopted by eminent English Engineers on the Haddiscoe and Halesworth Railway, in England, on the Altona and Kiel, on the Royal Danish Railway, and, I believe, on other Lines on the Continent.

These circumstances undoubtedly justified the adoption of such a system in the Specifications. This road is certainly superior to the road laid with light cast-iron chairs, so common in the Northern States; and where it is fully ballasted and well maintained with good material, it runs well; but from a study of those parts of your Line where it has been most severely tried, I have concluded that present experience might lead you to the adoption, in future works, of the single T rail, with fished joints, or with Adams's braket chair of wrought iron, either of which, I believe, would make a more perfect road; but it is right to add that even the first and best known of these was not generally accepted as an improvement when your road was designed. Meanwhile, on the existing portions of your system, I believe that a sensible improvement might be effected by putting in large-sized sleepers at the joints, and arranging the spaces between the sleepers so as to be least next the joint sleepers.

The Crossings of your Permanent Way are of good construction, and the simple shifting rail adopted for Switches is, in my opinion, the best suited for the climate.

ROLLING STOCK.

From the voluminous calculations prepared for me by Mr. Trevithick, your Locomotive Superintendent, I annex six Returns relating to the Rolling Stock and the working of Engines (Appendices Y 1, Y 2, Y 3, Y 4, Y 5, and Y 6.)

The total number of Engines in stock on all your Lines, on June 1st, 1857, was 172, and their average age 29½ months.

The number of Engines supplied by the English and Canadian Contractors, under Contract, were 63 and 23 respectively; the total number supplied by the English Contractors being 69 and by the Canadian Contractors 25.

The engines supplied by the Canadian Contractors were made by approved manufacturers, and from an examination of the greater number of them I can speak favourably of their construction.