pointed out as appertaining to the three general plans of trussing, (viz., the arched truss, and the cancelled, trapezoidal truss, with and without the verticals,) to be made easily available, in the construction of iron bridges for rail roads, for all spans under 160 or 180 feet. The modifications required to adapt the same to the purposes of common travel will readily suggest themselves to the practical engineer and skillful mechanic.

It is not expected that these details are so full and clear as to leave no necessity for the exercise of ability, skill, and judgment in carrying them into practice. The plan and purpose of this work would not admit of such minuteness of detail, if the time, experience and ability were not wanting to accomplish the object. Neither is it presumed that some of the details that have been given, may not be susceptible of material improvement. Still, I do entertain the fullest confidence that nothing is here given but that is highly feasible, and worthy of being used as a guide, where better plans and modes are not known.

LXII. I have not yet spoken of stretches of more than 180 feet; not that this length forms a limit beyond which it would be impracticable to construct bridges on these general principles. But for greater spans than what is here mentioned, I would suggest the following modification of the truss Fig. 7, p. 12.

It is desirable that a transverse bearer should be contained in the structure, at least, once in 12 or 15 feet. Hence, in long stretches the verticals and diagonals become very numerous, and the former being very long, and acting by thrust, must necessarily act to a great disadvantage. It is proposed therefore, to form a simple truss as in Fig. 7, of a height of from $\frac{1}{6}$ to $\frac{1}{3}$ the length, containing from 5 to 7 full length verticals, (or from 3 to 5, dispensing with the end ones,) and between each two of these, make use of suspension chains and 2 or more short verticals, when the track is to be on the top, or sub-arches