In the improved lattice the first two requisites are attained by a system of arch-braces and straining-beams, which is the simplest method of relieving both the chords in the centre, and the braces and ties at the abutments. Arches are preferable, but rather more expensive.

The arrangement of the intermediate timbers is similar to that of the common lattice, and the manner of forming the connections by wooden pins is the same; but the ties instead of being inclined are vertical, a position which is more natural, more efficient, and requires less material.

The braces instead of being single are reduced in size and placed in pairs, one on each side of the tie, which accordingly passes between them, and is pinned at every intersection.

This arrangement secures the third, fourth, and fifth requisites. The inclined pieces, from the manner of their connection, are equally capable of acting as braces or ties, and therefore the truss is counter-braced by a system of diagonal ties, without the necessity of introducing timbers expressly for this purpose, as in most other plans.

The braces being in pairs, with the ties passing between, as in the figure, will possess the stiffness of a hollow cylinder.

In this respect it possesses the only good quality of the double lattice, but in a higher degree, for there are here intermediate points \( a \) and \( b \), formed by the passage of ties to which the braces are pinned, and which add greatly to the stiffness.