

2d. The tie is vertical, or perpendicular to the lower chord, a position which is more natural, and in which it is more efficacious than when inclined.

3d. The end-braces all rest on and radiate from the abutment, by which means a firm support is given to the structure, and the truss is not required of greater length than is sufficient to give the braces room.

4th. The truss is effectually counter-braced, the braces becoming ties, and the ties braces, when called into action by a variable load, and are capable of opposing a resistance on the principle of the inclined tie of the ordinary lattice bridge.

It is readily admitted that the strength in the inverted is less than in the erect position, but it must be remembered that the unloaded bridge is always in equilibrium; that the action of the parts which renders counter-bracing necessary, results entirely from the variable load, and that, therefore, a combination of timbers to resist its effects should not be as strong as that which sustains both the permanent and the variable loads.

Behind the ends of the lower chords at the abutments, and between them over the piers, double wedges are driven, the object of which is, by the compression which they produce, to relieve the tension of the lower chord.

For ordinary spans, the dimensions of the timbers may be

Braces	2 in. by 10 in. in pairs.
Ties	3 " 12 "
Arches or arch-braces	6 " 12 "
Chords	3 " 14 " lapped.
Pins	2½ in. in diameter.

In conclusion, it is proper to remark that the proposed plan is not recommended as the best under all circumstances, but it is as economical in first cost as any other that can be used. The arrangement will be found even more simple than the ordinary lattice, and it is equally applicable for bridges on common roads or railroads, and for roof or deck bridges. The braces, in consequence of being placed in pairs, require a slight increase of timber over the common plan, in the proportion of 40 to 36, but the diminished lengths of the ties and of the truss more than counterbalance this increase.