And is equivalent to
Tension on lower chord

12,000 lbs. sq. in.
48,000 “

The ties and braces form three distinct systems. The proportions of weight sustained by each may not be equal, and cannot be estimated with certainty, as one system may be brought into a higher degree of tension than another by driving the wedges unequally. In making a calculation, however, it will be assumed that they bear equally and each one-third of the weight.

The weight at the end being 83,500 lbs., the tension in the direction of the diagonals will be 116,900 lbs., or 38,966 lbs. to each system. This is resisted by two ties, the united cross-section of which is three inches, making the tension 12,988 lbs. per square inch.

The result of this calculation shows, that with the dimensions assumed the ties are stronger than the chords, and that heavier proportions are required to sustain a load of one ton per foot in addition to the weight of the structure.

For lighter loads the bridge is sufficient, and by increasing the dimensions, the trusses can be made as strong as may be necessary for ordinary spans.

When the top chord extends above the roadway so that it cannot be braced laterally, it is very important that its horizontal dimension should be increased as much as possible to prevent lateral flexure.

The dimensions used in the calculation are those of a bridge at 109th street in the city of New-York, as reported to the writer; they may not be entirely correct in every particular. The calculation has been made for a bridge of two trusses, for the sake of uniformity, as the other calculations have been made in the same way.