It appears therefore from this calculation, that if the arches are omitted, the end braces should be supported in the middle by diagonals in the opposite direction. As an additional security, the depth should be increased to 9 inches. In the other panels they should diminish gradually to the middle of the span, where the original dimensions are sufficient.

Floor Beams.

The floor beams are 7×14 inches, width in clear between supports 11 feet, distances from centre to centre $5\frac{1}{2}$ feet.

The weight on the drivers of a locomotive 18 tons, may be considered as distributed nearly equally over 3 floor beams, which will give 6 tons for each beam.

$6 \times 3 \div 5{\cdot}5 = 3{\cdot}3$ tons $=$ the equivalent weight in the middle of the beam

$R = \frac{18\,w\,l}{b\,d^2} = \frac{18 \times 6600 \times 11}{7 \times 14^2} = 952$ pounds $=$ maximum strain per square inch.

Lateral Braces.

The lateral braces are $4\frac{1}{2} \times 7$ and 8 feet long. The prevalent winds are usually in a direction nearly parallel to the axes of the bridge, so that its exposure is not great. Assume as the basis of a calculation that the sides are closely boarded 20 feet high, and that the perpendicular force of wind may be 15 pounds per square foot, the whole pressure upon one span will be 45,000 pounds. As there is lateral bracing both above and below, this pressure would be resisted by 4 lateral rods 1 inch diameter $= 3{\cdot}14$ square inches, or 3,344 pounds per square inch.

The proportional strain upon the lateral braces would be $\frac{45{,}000 \times 8}{5} = 72{,}000$, to resist which, are 4 braces $4\frac{1}{2} \times 7 = 126$ square inches $= 571$ pounds per square inch. The bearing surface at the joints does not much exceed one-half the area