action of the load upon the opposite side, is not more than 121,070 pounds, or 62,000 pounds to each truss.

As there are twelve panels between A and G, there are consequently twelve counter-braces to resist this force, and if each of them sustained an equal portion, there would only be 5170 pounds to each; but a more nearly correct distribution of the pressure is, to allow nothing for the strains at A and G, and double the average for the strain at f; consequently, the greatest possible strain upon any counter-brace, would be less than 11,000 pounds, or only 262 pounds per square inch.

If iron rods had been used for counter-bracing, a cross-section of 1 square inch to each panel would have been an ample allowance.

We will now estimate,

2nd. The strength of the truss itself without the arch.

DATA.

The distance of the centre of gravity from the point of support, is 39 feet.

The distance from middle of upper to middle of lower chord, is 17 "

The resisting cross-section of upper chord, is 205 sq. in.

The combination-keys of the lower chord cut off one-half inch on each side of each chord plank, or three inches. The splice at each panel 4½ inches; the combination-bolt about equivalent to 1½ inches; there remains, therefore, for the actual resisting area of the lower chords 135 "

We will assume that timber should never be subjected to the action of a weight that could be sufficient to impair the elasticity; and that within the elastic limits, the resistances to compression and extension are equal. We will also leave out of view the additional strength which is derived from the continuity of the spans; since this advantage would not be possessed by the spans at the extremities, or by an isolated span of the same extent. The calculation, therefore, will be made,