Principle of Calculation.

The weight of the half truss \( AB \) is supposed concentrated at the centre of gravity \( C \), and acts with a leverage \( AD \) equal to one-fourth the span. It is sustained in equilibrium by the horizontal pressure in the middle of the chord, acting with a leverage equal to the height of the truss. The equation of moments is therefore \( H \times h = w \times \frac{s}{4} \) or \( H \times \frac{w \times s}{4h} \),

- \( H \) = horizontal strain upon the chords,
- \( w \) = weight on half-span = 30,000 lbs. nearly,
- \( s \) = span = 30 feet,
- \( h \) = height of truss = 3 1/2 ft.

Therefore \( H = \frac{30,000 \times 30}{4 \times 3 \frac{1}{2}} = 64,286 \) lbs. which is nearly the same for the upper and lower chords. To resist this strain we have in the upper chord 84 1/4 square inches, and as the strain is compressive it resists with its whole area—the strain is therefore 8000 lbs. per square inch nearly.

The lower chord has a resisting cross-section equal to the whole area 6 square inches, for as the span is only 30 feet it is not necessary that there should be a joint.

The strain per square inch will therefore be 10,712 lbs.

The suspension rods next to the abutments sustain one-half the weight of the bridge, or 30,000 lbs.

The cross-section contains 2 1/2 square inches.

The strain per square inch with the greatest possible load will be 12,000 lbs.

The strain upon the braces will be to the strain upon the ties in the proportion of the diagonal of the panel to the per-