Weight of one-half span complete (77 feet) 120,000 lbs.
Distance of centre of gravity from point of support 37 feet.
Weight of one-half span with load 275,000 lbs.
Distance between shoulder of post 15½ feet.

*Calculation of Truss without the Arches.*

Let \( x \) = distance of neutral axis from top chord.
19 \( - x \) = distance from bottom chord.
\( P \) = pressure per square inch on top chord.
\[
\frac{P}{x} (19 - x) = \text{strain per square inch on bottom chord.}
\]

400 \( P \times x = 280 \frac{P}{x} (19 - x)^2 \).

\( x = 8.3 = \text{distance from top chord.} \)

And 19 \( - x = 10.7 = \text{distance from bottom chords.} \)

400 \( P \times 8.3 + 280 \frac{P}{8.3} \times 10.7 = 275,000 \times 37. \)

\( P = 1532 \text{ lbs.} = \text{pressure per square inch on top chord.} \)

And 1532 \( \frac{10.7}{8.3} = 1,975 \text{ lbs.} \) = strain upon bottom chord.

The bottom chords derive some assistance from the masonry, but as the roadway is on the bottom of the truss, little opportunity is given for wedging the lower chords, and for this reason the assistance to be derived from this service is not estimated.

*Ties and Braces.*

The weight upon the middle panel (12⅓ lineal feet) is 45,000 lbs. To resist this there are four posts, the cross-section of each being 72 square inches, or the united cross-section 288, equivalent to 156 lbs. per square inch.

The distance between the shoulders of the posts being 16½ feet, and the width of the middle panel, exclusive of posts, 11½ feet, the diagonal will be 19·3.

The strain upon the diagonal will be 45,000 \( \times \frac{19.3}{15.5} = 56,000 \)