The pressure upon the brace will bear to the force at $A$ the proportion of the diagonal to the side $A\, D$. If the brace be removed the pressure must, nevertheless, still continue, and if it is resisted by a brace $e\, f$, the pressure upon $e\, f$ will be greater than upon $A\, B$ in the proportion of $A\, D$ to $e\, D$, because $D$ is a fulcrum and $A\, D$ and $e\, D$ the leverages of the acting and resisting forces. If $e\, f$ is parallel to $A\, B$, which is generally a very favorable direction, the length $e\, f$ and $A\, B$ will be in proportion to the distances $D\, e$ and $D\, A$, and may be substituted for them. In the present case the force of wind, 45,000 pounds, acting with a leverage of ten feet, will give its moment 450,000, or 225,000 pounds acting at a distance of 20 feet. The length of the diagonal is $\sqrt{20^2 + 16^2} = 25.6$ feet.

and the strain in the direction of the diagonal $\frac{22500 \times 25.6}{16} = 36,000$ pounds.

The length of the knee-braces being 5 feet, the strain upon them will be $36,000 \times \frac{25.6}{5} = 184,000$ pounds. This is resisted by 15 braces (one to each post). The cross-section of each is 25 square inches, but, as the bearing surface of the joint does not extend over the whole surface of the section, the resisting portion will be reduced to 15 square inches. The strain per square inch will therefore be $\frac{184000}{15 \times 15} = 818$ pounds.

For the resistance to flexure of the 15 braces, $w = \frac{9000 \times 5 \times 5^3}{5^2} \times 15 = 3,555,000$, or about 20 times the pressure.