

formly loaded. For instance, take the case of a twenty-foot panel and an eighteen-foot clear roadway, the re-action at each end of the beam is about nine tons. Suppose the centres of beam-hanger holes to be situated on the corners of a four-inch square, and the plate to be seven inches square, then the bending-moment is

$$M = \frac{1}{8}WL = \frac{1}{8} \times 9 \times 4 = 4.5 \text{ inch tons.}$$

The resisting moment is $\frac{RI}{d_1}$, where $R = 5$ tons, $I =$ moment of inertia $= \frac{1}{12}bd^3 = \frac{7}{12}d^3$, and $d_1 = \frac{d}{2}$. Equating the moments, substituting, and solving, gives $d =$ about seven-eighths of an inch, a result agreeing with good practice. It is almost needless to say that this method is very approximate; for the plate is greatly stiffened by the rigidity of the flange of the beam, while, on the other hand, no reduction has been made for the beam-hanger holes.

Lacing, or, as it is often improperly termed, single latticing, is about the most common detail for keeping pairs of channel bars in line: nevertheless, it must be inferior to latticing, especially when the lattice bars are riveted together at their intersection. By inspecting Tables XXXII. and XXXIII. it will be seen that a system of lacing-bars with one rivet at each end of a bar requires much larger stay plates at the ends than does a corresponding system of latticing or double-riveted lacing.

The actual sizes of lattice or lacing bars for any strut can be determined only by experiment: it is thought that those given in Tables XXX. and XXXI. are so strong, that the struts on which they are employed would break in the channels rather than in the bars, and yet not so heavy as to cause much unnecessary use of material. It will be seen also in these tables, that the requisite dimensions of latticing and lacing bars depend not only upon the sizes of the channels which they connect, but also upon the distance apart of these channels: this is due to the fact that the bars are subject to compression as well as to tension. The lengths and weights of latticing and lacing