

following descriptions, by which the use of bars beyond a certain size is avoided in the longer spans.

The difference consists in the arrangement of the tie bars. In the channel span of 177 feet, the ties cross three of the panels formed by the vertical posts; in the 140 feet and $88\frac{1}{2}$ feet spans they cross two panels, while in the $76\frac{1}{2}$ feet span they cross but one panel.

When the ties cross three panels diagonally, as in the channel span, the truss partakes somewhat of the character of a lattice; and the principle is capable of being extended still farther for longer spans by making the ties cross four or more panels according to the length of the girder.

As rolled bars of a much greater width than nine inches cannot be depended upon for such uniform strength and tenacity as the smaller bars, it will be observed that the above arrangement is an exceedingly good one; especially where spans of different lengths have to be united so as to present a uniform appearance.

DESCRIPTION OF CHANNEL SPAN.

The length of girder, = 177' 3".

Width between centres of girders, = 10' 6".

Height of girder between horizontal plates, = 16' 9".

These girders are divided into 33 panels of 5 feet 3 inches each, by vertical posts, as shown in the diagram, Fig. 1.

The end posts are composed of six T bars, $5'' \times 3\frac{1}{2}'' \times \frac{1}{2}''$, placed in pairs, with two side plates, $25\frac{1}{2}'' \times \frac{3}{8}''$, and one end plate, $12\frac{1}{2}'' \times \frac{3}{8}''$; the whole having a sectional area of 48.18 square inches.

The next post has two T bars, $5'' \times 3\frac{1}{2}'' \times \frac{1}{2}''$ and two side plates, $10'' \times \frac{1}{8}''$, with a sectional area of 14.37 square inches.

Posts 3 to 5 are composed of two T bars, $6'' \times 4'' \times \frac{5}{8}''$, with a sectional area of 11.72 square inches.

Posts 6 to 8 have two T bars, $6'' \times 4'' \times \frac{1}{2}''$, with a sectional area of 9.50 square inches.

Posts 9 and 10 have two T bars, $5'' \times 3\frac{1}{2}'' \times \frac{1}{2}''$, with a sectional area of 8.12 square inches.

The posts from 10 to the centre of the truss have two T bars of $5'' \times 3\frac{1}{2}'' \times \frac{7}{8}''$, with an area of 7.10 square inches.

All the posts have diagonal bracing between the T bars. They are divided into five spaces, between the chords, by cross plates