Some other common forms of upper lateral struts are the following: two tee-irons trussed, the upper resting on the chords, and riveted thereto, the lower abutting against the same, and attached by bent plates; two channels trussed and attached to the chords in the same manner; a combination of a channel and a plate, with trussing between; and two tee-irons laced or latticed, with a jaw plate at each end wider than their flanges, screwed up to the chords by nuts on the ends of the chord pins. Owing to their lack of both strength and rigidity, all these are poor contrivances, two channels laced or latticed being the best form of strut that can be designed for the upper lateral system.

As stated in the “General Specifications,” in no highway bridge should the channels in chords, posts, or batter braces, be less than five inches in depth, nor in any other part of the structure less than four inches. One does hear occasionally of such a thing as a three-inch channel top chord with two-inch pins, for a sixty or seventy foot span. But, fortunately for the public safety, such structures are few and far between. The author once heard the senior representative of one of the most flourishing highway-bridge companies in America contend that two three-inch channels trussed make a very good centre post for short through-spans,—strong enough, because the area called for by the stress is less than three square inches. He must either have forgotten, or been ignorant of, the fact that stiffness is as important a factor in a bridge as simple strength. In reality, strength is dependent upon stiffness; for where vibration can occur, the stresses are increased, not only in the members where stiffness is wanting, but in adjoining members of the structure.

Light sections for compression members are more economical than heavy ones, and it is generally preferable to use them. But, if the situation be one where the members will be exposed to excessive moisture, the webs should be thickened.

The top plate for chords and batter braces should generally be from one-quarter to three-eighths of an inch thick. Any thing below the inferior limit would be liable to distortion when roughly handled, and to rust through too readily; and any thing above the superior limit would usually be inconsistent with the best distribution of area in the section.