structure to a combination bridge. Not at all,—no more than the employment of wood for the floor and joists; because, at the same time when the latter are renewed, the wooden struts can be replaced. There is a slight objection for short through-spans, viz., that it reduces the headway; but it would not greatly increase the expense to add eight inches to the depth of the trusses.

Another method of avoiding the difficulty is to rivet the floor beams to the posts. But will not this be equally objectionable? Certainly such a connection is better for the beams, as it partially fixes their ends; but what about the deflecting effects of wind stresses and passing loads upon the posts? The transverse components of the lateral rod stresses act with great leverage, for the beams are always attached above the bottom chords; and the weight of a heavy wagon coming suddenly upon the beam must certainly cause the posts to vibrate transversely to the planes of the trusses, but to what extent, and with what injurious effect upon the posts, it is at present impossible to say. Even if there be but little known concerning this attachment, it is certain that a floor beam should never be riveted to only one of the channels of each post. Such an arrangement would produce indirect stresses of a destructive character: consequently the posts should be turned one-quarter way round in order to let the beam pass between them.

Floor beams in deck bridges may either rest upon the chords, be hung from the chord pins, or be riveted to the posts. In neither case should they be used as lateral struts when the lateral rods are attached to the chord pins, because of the leverage that would be afforded to the lateral stresses to produce distortion.

It is not customary to calculate the thicknesses of beam-hanger plates, for they are usually made from three-fourths of an inch to an inch thick for ordinary highway-bridges; but under certain assumptions their thicknesses can be calculated. If the load on a plate be considered uniformly distributed over the portion between the beam-hanger holes, and if the flange of the beam be supposed to take up no bending-stress, the plate may be considered as a beam supported at the ends, and uni-