After entering these dimensions on the "Bill of Iron," we refer again to the "List of Members," and, after omitting re-enforcing plates at middle of posts, come to the connecting-plates for lateral struts to top chords. The thickness of these plates should be \( \frac{3}{8} '' \), and the average width of the legs \( 2\frac{1}{2} '' \). The area of a \( 4'' \times 6\# \) channel is 1.8 square inches, and the intensity of working-stress for forty-two diameters with both ends fixed is, by Table XI., 2.74 tons; making the greatest stress that could ever come upon the channel \( 1.8 \times 2.74 = 4.93 \) tons. The lever arm of the stress is \( \frac{1}{8}(\frac{1}{4} + \frac{3}{8}) = \frac{7}{16} \) inch, making the moment \( \frac{7}{16} \times 4.93 = 2.16 \) inch tons, which divided by 0.389, the resisting-moment for a \( \frac{3}{4} '' \) rivet, as given in Table XXXVII., gives six as the number of rivets required for attachment to the lateral strut channel. Although the leverage is a little greater for the attachment to the chord-channel flanges, still six rivets will suffice, on account of the liberal estimate for stress, and using rivet tables which have a surplus of strength for lateral system connections. The length of each leg of the \( \mathbb{T} \) will be about eighteen inches, for various circumstances will necessitate wide rivet spacing in this detail.

The stress and leverage being the same in the two attachments, it is evident that six rivets will be required at each end of the upper channel of the lateral strut for connection to chord. There will be just room for this number; putting two through the channel flanges, and four through the plate between the channels. Were these not strong enough, we could use seven-eighths inch rivets.

The next item upon the "List" is connecting-plates for portal struts to batter braces. These should have a greater strength than ordinary calculations would indicate, in order to provide against the racking effect of the wind. If we use a jaw plate, as in the first of the accompanying diagrams, and two bent plates, as in the second, to attach to the flanges of the strut channels and the web of the batter brace, we provide against all contingencies. These plates are bent at right angles about the lines \( AB, CD, \) and \( EF \). It may be well to test the num-