and $V$ (vide Appendix I) = one-half the length of span multiplied by the release of pressure per lineal foot on the windward truss, or

$$\frac{80 \times 30 \times 10 \times 9}{15 \times 2000} = 7.2 \text{ tons.}$$

Substituting these values gives $C_x = 9.75$ tons. Assuming four-inch channels, the ratio of length to least diameter will be 42, for which, with one fixed and one hinged end, Table XI, gives an intensity of 2.245: therefore the section required is 4.38 square inches, corresponding to two 7.3# channels. It will be more economical to use 5" 7# channels, which will be considerably stronger. At the fixed end of the span a 5" 10# I will answer for a strut between pedestals.

We are now ready to proceed with the "Bill of Iron," in making which, close approximations of lengths are allowable.

Let us prepare the blank form recommended in Chapter XIV., then turn to the list of members given in Chapter III., and fill out the form, proportioning as we go any details whose sizes have not been previously determined. The filling-out of the part denominated "Main Portions" is a very simple matter, and needs but little explanation. It is to be noticed that the lengths of the chord bars and main diagonals have been increased by three feet to allow for the weights of the heads, and those of all adjustable rods by five feet to allow for the weight of the eyes, upset ends, and adjusting-nuts. The intermediate and portal struts are placed seven feet below the level of the upper chord pins, so as to allow a clear headway of fourteen feet.

The size of the floor beam is taken from Table XIX.

The grouping of members having some similar dimensions is to be observed. It involves considerable economy of labor, if one has to estimate on many bridges. In filling out the last vertical column, the tables on pp. 88–93 and 104–109 of Carnegie's "Pocket-Companion" will be found very useful. Let us employ latticing for the top chords, batter braces, posts, and portal struts, and single-riveted lacing for the lateral struts.