The first of these stresses produces bending; and the second, direct tension on the rivets. The moment of the first stress is about

\[ 13.82 \times \frac{1}{3} \left( \frac{3}{8} + \frac{3}{4} \right) = 9.5 \text{ inch tons}, \]

which, divided by 0.493, the resisting-moment for a seven-eighths inch rivet, found in Table XXXVI., gives twenty as the number of rivets to resist bending. To resist tension the number required will be

\[ \frac{10.37}{5 \times 0.6} = 4, \]

making twenty-four rivets in all for the connection. Seven-eighths inch rivets are rather large for the flanges of a ten-inch beam, as there is not room for full heads: nevertheless, it is better to use them, on account of the increased bending resistance. Using twelve rivets on a side, and spacing them two inches and a half apart, will make the length of the plate about thirty-two inches. It is evident that there is no need of figuring for bearing in this connection.

Next let us proportion the connecting-plate over a post, assuming the thickness to be three-eighths of an inch, and using five-eighths inch rivets. The moment on the rivets will be

\[ 11.605 \times \frac{1}{3} \left( \frac{3}{8} + \frac{3}{4} \right) = 5.08 \text{ inch tons}, \]

which, divided by 0.18 (the resisting-moment of a five-eighths inch rivet), gives twenty-eight as the number of rivets required, or fourteen for each lug. Using staggered rivets spaced two inches apart will make the depth of each lug about fifteen inches.

The number of rivets necessary for attaching the plate to the beam is partly dependent on the counter stress, and partly upon the length of plate which we consider requisite for fixing the end of the post. About eighteen inches ought to suffice for this purpose. The horizontal component of the counter stress, including initial tension, is \( 9.625 \times 0.89 = 8.566 \) tons, and its moment on the rivets is

\[ 8.566 \times \frac{1}{3} \left( \frac{3}{8} + \frac{3}{4} \right) = 4.82 \text{ inch tons}, \]

which, divided by 0.311 (the resisting-moment for a three-