more effectually in a web and flange form, as in the I beam, with about half the material in the flanges. In this kind of beam, the web may be estimated as a rectangular beam — say at 5,000 lbs to the inch (on a leverage equal to the depth of the beam), while the flanges may be estimated at 15,000 lbs upon a leverage of half the depth of beam, less half the thickness of flange, thus: for a beam 12" deep, web $\frac{1}{2}$" thick, flanges 2" wide and $\frac{1}{4}$" in average thickness on each side of the web, we have 6 square inches of web section at 5,000 = 30,000 lbs. plus, 6 inches of flange section at 15,000 x leverage of 5,625", equal to 42,187 lbs. on a leverage of the depth of beam, making a total of 72,187 lbs. = 6,015 lbs. to the inch upon the whole section.

Hence, it is deemed safe to estimate the working strength per square inch of wrought iron I beams, in the above proportions of web and flanges, at 6,000 $\frac{p}{L}$ lbs. for projecting ends, and 24,000 $\frac{p}{L}$ for beams supported at the ends, and loaded in the middle; and double those amounts of distributed load. For instance; a 12" I beam of 12 square inches in section, and 16' long, between bearings, is good for 24,000 x $\frac{13}{8}$ = 18,000 lbs. in the middle, 36,000 distributed uniformly, and 26,180 lbs. upon two rails 5 feet apart, or 5.5 feet from end supports.

XC VIII. One of the cases in which wrought iron is frequently exposed to transverse strain, is in the use of cylindrical pins for connecting the other parts of bridge work. In such cases, the forces will act with a certain leverage which can be nearly determined. The power of a round pin to sustain a transverse force acting on a leverage equal to the diameter, may be assumed at about $\frac{1}{10}$ less to the square inch, than that of