If the heading be formed in the central part of the stick, as by a mortice or pin hole, two cleavages must be made from the hole to the end in order that the part may be forced out. Hence, the hole need be only about five times the width of hole from the end; that is, an inch hole should be five inches, and a two inch hole, 10 inches from the end.

**Transverse Crushing.**

Timber is sometimes liable to be crushed by forces acting transversely to the direction of its fibres. If the pressure be applied to the whole side of the piece, it should not exceed 150, or at most 200lbs. to the square inch, in practice. If acting on one-half of the surface, it may perhaps, be 300lbs. to the inch, without yielding very injuriously; and, for a very small portion of surface, as under a bolt head or washer, a pressure of 500lbs. to the inch may be admissible. These limits are taken with reference to pine timber. Hard timbers, will bear, probably, 25 to 50 per C. more with safety.

**Connections of Tension Pieces, and Proportionate Amount of Available Section.**

CXLIV. From what has been already said, it follows that for a piece to act with the best advantage by tension, if the connection be made all at one point in the length, one-half of the fibres require to be cut off, so as to form an area of heading equal to the cross-section of the remaining part of the stick; since it has been assumed that the power to resist tensile strain with safety, is the same as the power to resist compression upon the ends of fibres. But if several headings, or shoulders be made at different points, or distances