

great care, and it should have sufficient meltings, 2 to 4, before being put into its final shape. Such castings, when broken, should present a fine-grained grayish fracture, and their skin should be generally smooth, but not smooth like stove-plate castings, as such iron is very unsuitable where strength is desired. Stove-plate castings must be made from a very fluid iron, one that runs thin, and sharply fills the moulds, and such irons are very weak. Ordnance iron, with a *tensile* strength occasionally equal to that of inferior wrought-iron, is the best cast-iron possible to have, but it is expensive, and rarely used on that account. Such a grade of iron, however, should always be insisted upon where bridges are permitted to be built having cast-iron top chords and posts.

TIMBER.

Whatever modesty is shown through conscious ignorance in criticising iron and its fabrication, it quickly disappears when the question of timber is under consideration, almost every one being positive as to what is good timber, and very frequently unreasonable exactions are imposed. The main trouble that arises, in the execution of contracts, arises from the interpretation given to the term *merchantable*, an expression somewhat vague, without other limitations. All bridge-timber should be *sound*—that is, free from loose or black knots, heart-cracks, and wind-shakes, and it should not be cut from logs obtained from dead trees. Seasoned timber,