be placed upon two supports and loaded with any known weight, not so great as to impair the elasticity.

Observe the deflection (d), the weight (w), the distance between the supports (l), the breadth (B), and the depth (D). The length being in feet, and the other dimensions in inches.

Substitute these values and perform the operations indicated, the value of R will be obtained.

This constant for cast iron has been found to be ·001 Tredgold.

"	"	White fir	"	"	"	·01	"
"	"	Oak	"	"	"	·0109	"
"	"	Yellow pine		"	"	·0115	"
"	"	American white pine			"	·0125	Author.

The formula which expresses the strength of a beam is $\frac{3\,w\,l}{2\,b\,d^2} = R$ when the beam is supported at both ends and the weight applied in the middle.

To determine the constant, weights should be applied and gradually increased as long as no perceptible flexure remains upon their removal.

The highest value of w thus obtained will give the value of R. In this formula, R expresses the maximum strain upon a square inch; but, in determining its value, when used in proportioning the parts of important structures, it is proper to observe, that the strength of materials generally diminishes as the length of time in use increases, and, that a weight which will produce no perceptible deflection in a short time, may produce a very great deflection when long continued.

From some experiments, made by the writer in the spring of 1840, it appeared, that locust would bear for a few seconds a strain of 5500 pounds per square inch without apparent injury, but the elasticity was impaired by 2304 pounds per square inch continued 16 days.

The value of R for cast iron when the time was short was found by Tredgold to be 15300 pounds

For White fir the constant is						3519	"
"	Oak	"	"	"		3825	"
"	Yellow pine		"	"		3825	"

The above constants were deduced from experiments and