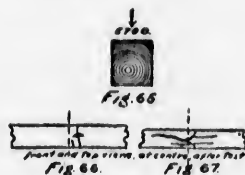


1,210,100 lbs. The coefficient of elasticity, as deduced from an increment of 1.315 in. in the deflection between the loads of 1000 lbs. and 7000 lbs., is 1,187,000 lbs.

Table L shows the several readings.

The test occupied 27 minutes.

The total weight of the beam was 290 lbs., or 32.89 lbs. per cubic foot on March 10th, and 282 lbs. 6 ozs., or 32.03 lbs. per cubic foot on March 13th, showing a loss of weight in the laboratory at the rate of .2860-lb. per cubic foot per day.



Beam XXX. This beam was tested May 3rd, 1894, with the annular rings, as in Fig. 65. When the beam was placed in position, it showed an upward camber of 24 ins.

The load upon the beam was gradually increased until it amounted to 5700 lbs., when the beam failed by the crippling of the fibres on the compression face, Fig. 66, the crippling extending $2\frac{1}{2}$ ins. upwards from the skin. The load was still increased, and when it amounted to 6580 lbs., the beam broke right across the tension face about $2\frac{1}{2}$ inches from the middle of the beam, and vertically above the second line of crippling on the compression side, Fig. 67.

The maximum skin stress corresponding to the breaking load of 5700 lbs. is 4634 lbs. per square inch, and the maximum skin stress corresponding to the load of 6580 lbs. is 5340 lbs. per square inch.

The coefficient of elasticity is 1,322,000 lbs., as determined by an increment in the deflection of 1.69 in. between the loads of 1000 and 5000 lbs.; it is 1,329,900 lbs., as deduced from an increment in the deflection of .84 in. between the loads of 2000 and 4000 lbs.

Table L shows the several readings.

The weight of this beam on May 4th, the day after the test, was 150 lbs. 11 ozs., or 30.96 lbs. per cubic foot.

Beam XXXI. This beam was tested May 4th, 1894. It was cut from the heart of the tree, and the annular rings were situated as in Fig. 68. Season cracks ran intermittently from end to end of the beam



in the neighbourhood of the neutral axis, the cracks extending radially outwards from the heart. The beam was free from knots for a distance of 7 inches on one side and 1 inch on the other, and the grain ran parallel to the axis.

The load upon the beam was gradually increased until it amounted to 6500 lbs., when it failed by a crippling of the fibres on the compression face, Fig. 69. The crippling occurred exactly at the centre and extended 1.5 in. upwards from the skin. The load was then continued, and, when it amounted to 7900 lbs., the beam failed by the tearing apart of the fibres on the tension face, Figs. 70, 71, and a line of crippling on the compression side: timber opened upwards for a distance of about 2 ins. or $3\frac{1}{2}$ ins. The fracture on the tension side took place about $5\frac{1}{2}$ ins. from the centre, and the timber opened