gradually increased until it amounted to 47,960 lbs., when a complete fracture took place by the tearing apart of the fibres on the tension side at the centre, and simultaneously by a longitudinal shearing throughout one-half of the length of the beam, as in Figs. 94, 95.

The maximum skin stress corresponding to the breaking load of 38,100 lbs. is 3991 lbs. per square inch; the maximum skin stress corresponding to the load of 47,960 lbs. is 5017 lbs. per square inch.

The total compression of the timber at the centre was .93 in., so that, taking the effective depth to be 14.3875 ins., the maximum compressive skin stress at the support would be 4161 lbs. per square inch, the corresponding maximum tensile skin stress being 4652 lbs. per square inch.

Assuming the usual law to hold good for the whole of the effective depth, the maximum skin stress would be 4447 lbs. per square inch.

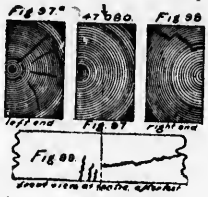
The co-efficient of elasticity, as determined by an increment in the deflection of .375-in., between the loads of 2000 lbs. and 19,000 lbs., is 1,164,700 lbs.

Table Q gives the several readings.

The total weight of the beam on March 1st, the date of test, was 524 lbs. 10 ozs., or 41.08 lbs. per cubic foot and on February 1st the weight was 597 lbs., or 46.73 lbs. per cubic foot, showing a loss of weight at the rate of .209-lb. per cubic foot per day.

The time occupied by the test was 48 minutes.

Beam XLIX was tested March 2nd, 1894, with the annular rings as in Fig. 97. The darkened portions represent sapwood.



The load upon the beam was gradually increased until it amounted to 47,080 lbs., when the beam failed by the tearing apart of the fibres on the tension side, accompanied simultaneously by a longitudinal shear, and a crippling of the material in the compression side, Figs. 98, 99.

The maximum skin stress corresponding to the breaking load is 1936 lbs. per square inch.

The total compression of the material at the centre was 2.8 ins., so that taking 13.095 ins. as the effective depth, the maximum skin compressive stress would be 5156 lbs. per square inch, and the corresponding skin tensile stress would be 7353 lbs. per square inch.

Assuming the usual law to hold good for the whole of the effective depth, 6835 lbs. per square inch would be the maximum skin stress.

The co-efficient of elasticity, as determined by an increment of .435-in., between the loads of 3000 and 21,000 lbs., is 1,052,600 lbs.

Table Q shows the several readings.

The weight of the beam was 525 lbs. 12 ozs., or 41.33 lbs. per cubic foot February 1st, and 473 lbs. 12 ozs., or 37.24 lbs. per cubic foot on March 2nd, showing a loss of weight at the rate of .141-lbs. per cubic foot per day.

The time occupied by the test was fifty minutes.

Beam L was tested March 10th, 1894, with the annular rings as in Fig. 100.