plan 846, assessed at $95, no improvements.

Shaw street, e. s., Wm. F. Cowan to Ellen J. Lindsay, 42x124, being lot 20 and part lot 21, plan D23, assessed at $848, no improvements.

Macdonell Ave., e. s., Rebecca E. Turner to Hattie D. H. Dunkley, 25x136, being south half lot 60, plan 452, assessed at $325, no improvements.

Queen St. E., s. s., Walter S. Lee to D. J. Sellers, 35x142, being part lot R, plan 900, assessed at $60.

Lindsay Ave., n, s., Katherine O. Boyden to William Arthur, 30x130, being lot 69, assessed at $210; no improvements.

Spencer Ave., w. s., George S. C. Bethune to Thomas McIlwain, 45x115, being south part lot 96, assessed at $1,125; no improvements.

Dufferin St., w. s., Farmer's Loan and Savings Co. to Chas. Leigh, 25x200, being south part lot 30, assessed at $400; no improvements.

THE STRENGTH OF BEAMS.

When a straight beam is fixed horizontally at one end and is loaded at the other end or over its whole length, it is no longer straight, but is curved downwards, and the vertical distance of the outer end from the original straight position is called the "deflection" of the beam. The amount of deflection caused by a given load will depend on the nature of the material, and will be scarcely perceptible in a beam or stone so long as the load does not approach too near the breaking weight. Also in beams of cast iron the deflection for a safe load is but small, but in those of wood, wrought-iron, and steel a considerable amount of deflection may be produced by a safe load and without injury to the elasticity of the material. The resistance of a beam to bending is called its "stiffness," while the resistance to fracture is called its "strength," and these two kinds of resistance follow very different laws.

When beams are employed in a building it is essential that the deflection under the load sustained should not exceed a certain quantity, otherwise the stability of the structure will be endangered. A convenient rule has been laid down by Tredgold in the case of floor timbers, that the deflection in the middle of a horizontal beam supported at each end shall not exceed one-fortieth of an inch for every foot of length, or 1 in. to a beam 40 ft. long, when fully loaded.

In a beam of "uniform strength" throughout its length and supported at each end, the line of curvature when deflected by a load at the centre will be an arc of a circle, and the deflection will be proportional to the square of the length divided by the product of the depth into the modulus E. In all other beams the deflection varies as the cube of the length multiplied by the load and divided by the product of E into the moment of inertia" (I) of the section. In a beam of rectangular section we have I proportional to the breath and cube of the depth, so that the deflection in beams differing in size but of the same material and with the same load is proportional to the cube of the length directly, but inversely as the breadth and cube of the depth.

The "stiffness" of a beam or its resistance to ending being inversely as the deflection under a given load, must, therefore, be proportional to the breadth and cube of the depth, and inversely as the cube of the length; while the "strength," or resistance to fracture, has been shown to be proportional to the breadth and square of depth, and inversely as the length.

When the load is uniformly distributed over the whole length of a beam which is supported at each end, its deflection is five-eighths of that produced by the same load placed at its middle point; and in calculating the deflection of a beam under a given load at the centre we must add five-eighths of its own weight to the given load in order to obtain the correct amount of deflection.

If the beam is fixed at one end and loaded at the other, we must add three-eighths of the weight of the beam to the load in order to obtain the true deflection.

In a beam of rectangular section supported at each end and loaded by a weight W in the middle, the deflection is found by the following rule: Divide the product of W into the cube of the length by four times the product of E into the breadth and cube of the depth; all dimensions being expressed in inches, W ank E being in tons.

If the beam is supported at one end only and loaded with W at the other end, then the rule for the deflection is: Multiply the cube of the length by four times W, and divide by the product of E into the breadth and cube of the depth; all dimensions in inches, W and E being expressed in tons.

(To be continued.)