

alternately retaining the deflection, and preserving a constant and uniform strain upon the truss.

The same effect is *partially* produced by counter-bracing; and the object of the present investigation is, to determine, approximately, at least, to what extent this may be done, and what is the real advantage of counter-braces, in trusses with parallel chords; beyond where they are necessary, to counteract the effects of unequal variable load, upon the different parts of the truss.

We have seen that Deflection results from three causes, all, of course, depending upon Elasticity; namely; difference effected in lengths of,—First, Chords, Second, Diagonals, and Third, Uprights.

The Theory of Counter-bracing is, that by the introduction of antagonistic diagonals, the material is prevented from regaining its normal state on removal of the load; and consequently, that it yields to the re-imposition of load, to much less extent than it would do, in the absence of Counters.

As to the deflection due to the difference in lengths of chords, equal, as before shewn, to one half of the whole, for a truss in which $L = 6$, and to more than half, when L is greater than 6; the counter-diagonals have no tendency to retain or diminish that difference, or the deflection produced by it. The diagonals and counters, simply contract or extend, (according as they act by tension or thrust,) the two chords equally, without affecting the difference between the two.