COUNTBRACING.

Page back, to one-half of the whole, for a truss in which \( L = 6H \), and to more than half, when \( L \) is greater than \( 6H \); 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.

On the contrary, the action of the counter diagonal tends to retain the tension (or thrust, in case of thrust diagonals), of the main in the same panel, and also, the compression (or tension), of uprights; and, in as far as that is accomplished, the deflection due to the elasticity of those parts, is retained, on removal of load from the truss.

Suppose, in a truss with tension diagonals, loaded and depressed as already explained, and all parts extended or contracted to the amount of \( E \times \) respective lengths; a counter-diagonal to be inserted in each panel, crossing the mains, as shown in the diagram (Fig. 52), and of half the size of the latter, such being the usual proportion for counters.

Now, the counters being adjusted so as not to act while the load is on, but ready to act immediately, as the main diagonals begin to contract, then, the load being removed, the main will contract by its elasticity, opposed by the counter, until they come to an equilibrium; each sustaining the same amount of tension. Still, the aggregate extension of the two beyond the natural state, must be essentially the same as that of the one, under the load; the one gaining, just as fast as the other loses.

But the main, having a cross-section twice as great as the counter (chords and uprights retaining the same