the signs + or — represent compression and tension respectively. It will be observed that the central members of the Isometrical Truss are subjected to both + and — strains. This, of course, is to be understood as due to the counteraction of a moving load, and is provided for in the other systems by members introduced expressly for the purpose. In the Howe truss we have indicated the counter braces, which are not theoretically required, by dotted lines; they are always introduced in practice, but are not required unless it be to hold the angle blocks against which the main braces abut. The method by which the strains were calculated in Figs. 9 and 10 is too well known to need any explanation. In Fig. 8 each system of triangles was treated independently, and the load upon each panel, including the weight of panel itself, was supposed to be applied at the point of each panel division. This is not strictly true in practice, since that portion of the load which is fixed will be partly sustained at the top of each division by the brace, but the error in effect is insignificant.

It may be interesting to notice that the effect of a change of load from the bottom to the top chord would be to transfer the amount of the minus strains with the signs changed to the compression members in each panel, and vice versa. The first thing that attracts attention in the examination of these figures is the great disparity between the strains upon corresponding members of the Isometrical Truss and the other two; but in order to reduce these figures to a tangible shape it will be necessary to determine the actual amount of material required to resist the strains, in each system, and then determine the relative percentage. This may be effected with sufficient accuracy for our present purpose by adding the total strains having the same signs in each, and multiplying the result by the theoretic length of the members corresponding. Thus the total minus strain in the Isometrical including counter system is 444 tons; assuming a divisor, for safety, of 5 tons per square inch for wrought iron, this will require \(88\frac{1}{8}\) square inches, which, multiplied by 23.6 feet, the length of a diagonal,