

It would be remembered that the main tie bar *ea* had to transmit four units of load; but these became multiplied in their power of strain on the tie, by the number of times the length of that tie exceeded the depth of the girder. This depth being 1, and the half length of the girder being 4, the length of the tie would of course be equal to $\sqrt{1^2+4^2}=\sqrt{17}$. The strain, therefore, would be the load $\times \sqrt{17}$. But as the length of the tie was also $\sqrt{17}$, it followed that the amount of metal must be $\sqrt{17} \times \sqrt{17} \times$ the load of 4; in other words, the amount of metal increased as the square of the length of any sloping tie. In this case the amount was 2 ties each $17 \times 4 = \dots\dots\dots$

Parts of
Metal. 136

Similarly, it could be shown, that the ties *ca*, *cH*, and their counterparts on the other side of the truss, would require $\sqrt{5} \times \sqrt{5} \times 2$ load $\times 4$ of them = $\dots\dots\dots$

40

That *ba*, *bD*, *dD*, *dH*, and their counterparts on the other side of the truss, would require $\sqrt{2} \times \sqrt{2} \times 1$ load $\times 8$ of them = $\dots\dots\dots$

16

and that the upper parts of these ties, *fa*, *gD*, *hD*, *iH*, and their counterparts on the other side of the truss, with the corresponding short ties, *fB*, *gB*, *hF*, *iF*, and their counterparts on the other side of the truss, would require $\sqrt{\frac{1}{2}} \times \sqrt{\frac{1}{2}} \times \frac{1}{2}$ load $\times 16$ of them = $\dots\dots\dots$

4

Making the total of iron in tension, as already stated 196

Further, the compression member, it had been proved, would contain $\dots\dots\dots$

Parts of
Metal. 172

The strut *He* would contain 1×8 units = $\dots\dots\dots$

8

The strut *Dc*, and the corresponding one on the other side of the truss, would contain 1×4 units $\times 2$ of them = $\dots\dots\dots$

8

The struts *Bb*, *Fd*, and their corresponding ones on the other side of the truss, would contain 1×2 units $\times 4$ of them = $\dots\dots\dots$

8

The struts *Af*, *Cg*, *El*, *Gi*, and their corresponding ones on the other side of the truss, would contain $\frac{1}{2}$ long $\times 1$ unit $\times 8$ of them = $\dots\dots\dots$

4

Making the total of iron in compression, as already stated 200