has been assumed as one ton per foot lineal, which will be one thousand pounds per foot lineal for each truss. If the panels are 10 feet (which is nearly an average for the bridges on the Pennsylvania Railroad), the greatest strain upon any single counter-brace will be 10,000 pounds, and this will be resisted by a single square inch of metal.

As a general rule, which will save much trouble in calculation, the proper cross-section of the counter-brace rods for railroad bridges of any span may be estimated at one square inch for every 10 feet of truss.

BALTIMORE AND OHIO R. R. BRIDGE. (Plate 12.)

The plan of this bridge was furnished by B. H. Latrobe, Esq., Chief Engineer. It is an admirable combination, possessing every essential of a well-proportioned and scientifically arranged structure. It is a system of counter-braces and braces. In its general principle it bears some resemblance to the celebrated bridge across the Rhine at Schaffhausen, but the latter, owing to the absence of counter-braces, was so flexible that it would vibrate with the weight of a single man, whilst the Baltimore and Ohio R. R. Bridge is so rigid that the heaviest locomotives, running with great velocity, produce but very little effect.

These bridges possess great strength, but they are not as economical in first cost as many others.

The calculation for the strains is more simple than in any other form of bridge; each set of arch-braces is to be considered as sustaining one-half the weight of the interval on each side of it, between it and the next set of braces.

Description of Details.

Fig. 1 shows the manner of adjusting the horizontal diagonal brace, in tie-beams.