

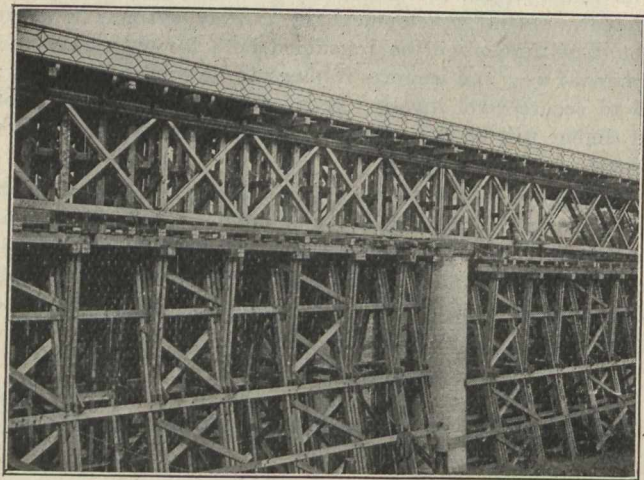
REPLACING OF GAUNLESS VIADUCT

By John H. Devey.*

The Gaunless Viaduct is situated between the villages of Cockfield and Evenwood, in the county of Durham, England, on the Bishop Auckland and Barnard Castle branch of the North-Eastern Railway, and formed part of the old Stockton and Darlington Railway, which company owned the famous engine, the "Rocket," now mounted on Darlington platform, which engine was built by George Stephenson, and at one time ran on this branch of the system.

Gaunless Viaduct was designed and built by George Bouch, the brother of Sir Thomas Bouch, builder of the

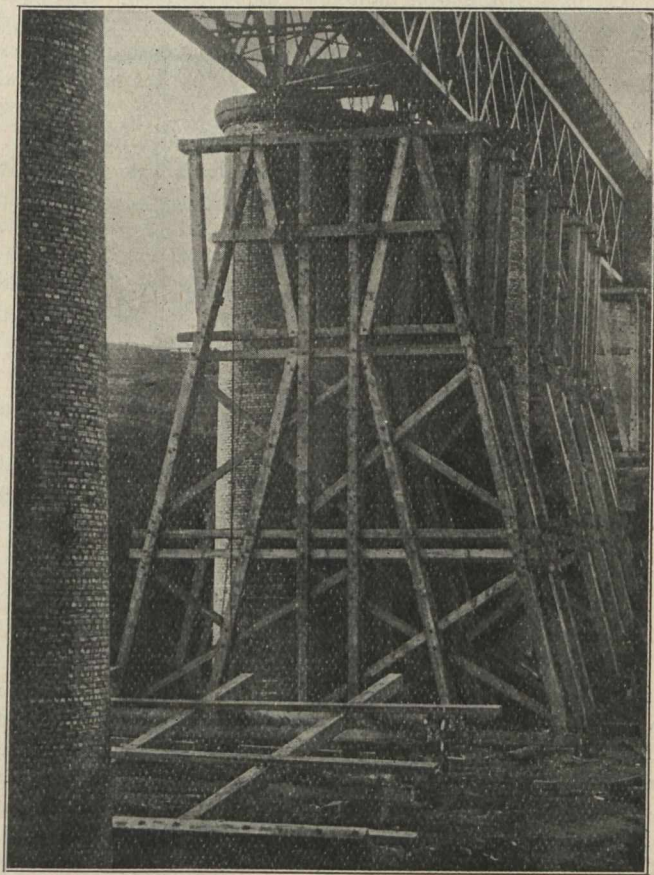
It was at first intended to build an entirely new viaduct and divert the tracks in order that the mineral traffic to the north would not be interfered with during the construction of the work. However, owing to the fact that piers and abutments, which were sunk through 40 feet of shale and coal, were in a good state of preservation, and, as the whole district was undermined by colliery workings, which would make it extremely difficult to get as good a foundation, and, as notice had been filed that were new piers and abutments sunk there would be a danger of the workings being flooded by the River Gaunless, which runs beneath the viaduct, and if such were the case the company would be liable for damages, it was decided to utilize the old piers and abutments. Although these workings had been abandoned for many years, an old shaft at the side of the viaduct was opened up as soon as we started operations. To overcome these difficulties, that is, keep the traffic going and at the same time renovate piers, abutments and bed-stones as well as replace the girders, it was decided to construct a trestle viaduct on the site occupied by the existing viaduct to accommodate the traffic.



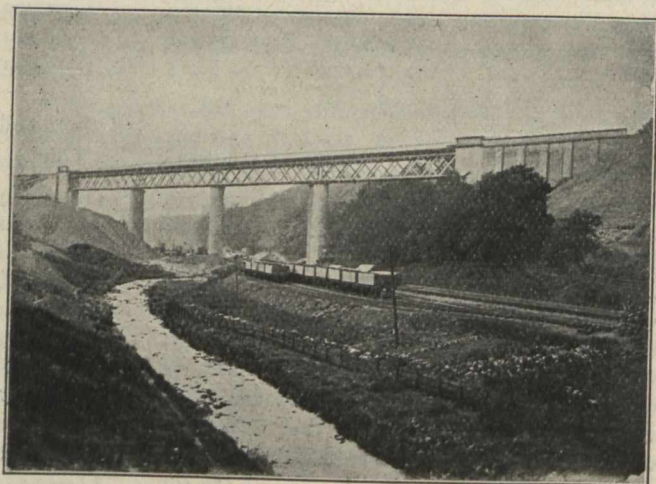
Gaunless Viaduct, showing Brick Pier and completed Trestle Work.

ill-fated Tay Bridge, about 1847. It is composed of four iron spans of continuous joint.

It was on the Stockton and Darlington Railway that the first iron bridge at West Auckland was built, and which was replaced by steel girders in 1904. Gaunless Viaduct was built for a double track on abutments and piers composed of firebrick, but the double track was not laid till the section, Barnard Castle to West Auckland, was double-tracked, and, as the girders were found to be too light for present-day engines and loads, it was deemed necessary to renew them. The centre pier was 66 feet from ground



Gaunless Viaduct.—Plan of Trestle Work.



Gaunless Viaduct.

level to top of bed-stone (piers 9 feet in diameter, bed-stones 11 feet). The piers and abutments were in a very satisfactory condition, and it was found necessary to renew only the bed-stones (re-laid with scrap granite) and repair and point the piers and abutments, the estimate for which was £500.

* Assistant engineer on the work.

The trestles were built as shown by photographs and drawing reproduced herewith, and it was decided so far as possible to have a standard height of trestle, but this was only possible in two out of the four spans, because in the one case the viaduct was on a grade of 1 in 264, and the ground fell rapidly to the first pier at either end of the viaduct.

A standard length of trestle was used in the two centre bays, placed on concrete foundations. In the two end bays as many trestles as possible were built of the same height and placed on subsidiary trestles of various heights, also placed on a concrete foundation.

Now, in order to take the grade on the viaduct, the under trestles were constructed with a level top from end to end, and on these trestles stringers were placed, and on that decking; these upper trestles were of variable height. The main trestles were 66 feet high, and upper trestles 19