and heated air passed through the tubes, which were surrounded by the water in the boiler. The furnace or fire-place was an external box, about three feet deep and two wide; the furnace was provided with an external casing; into the space thus formed the water from the boiler passed: a large additional amount of heating surface was also thus obtained. The boiler or flue-tubes—"which has since proved to be the main-stay of the modern locomotive"—was the invention of Mr. Henry Booth, the secretary of the railway; a gentleman "to whom railways are indebted for much of their practical efficiency." From the invention not having been patented, Mr. Booth did not receive the great pecuniary advantages which might otherwise have resulted from this highly valuable improvement. We understand, however, that he received a pecuniary reward from the directors of the railway on account of it. As will be seen on inspection of the diagram, the cylinders were placed outside the boiler, near the fire-box, and inclined at an angle; and the piston-rod of which is connected with the driving-wheel by means of a connecting-rod.*

The "Rocket" of Mr. Stephenson not only won for him the prize, but he obtained an official appointment in the service of the Company.

On the 27th of September, 1825, the Stockton and Darlington line of Railway, twenty-five miles long, was opened for public traffic. Twenty miles of this was worked by locomotives and horses, the powers of each being thus put in close competition. At this early period in the history of a line of railway, the first ever laid down on the improved principles as introduced by Stephenson, and which formed the nucleus of the railway system, the locomotives employed on it were five in number, four having been manufactured by Messrs. Stephenson at their factory at Newcastle, and one by Mr. Wilson of the same town. Such, however, was their inefficient working condition, that the power of steam was about to be abandoned, and horses alone employed. Timothy Hackworth,

* "Steam Engine, its History and Mechanism." By R. S. Burn.

who, through the intervention of George Stephenson, had been appointed manager of the working department of the railway, stepped forward at this critical juncture, and proposed to construct an engine capable of working the line to the extent already mentioned. His offer was accepted, and he forthwith began his operations, which were eminently successful, and contributed greatly to the rapid progression of steam locomotion.

Mr. Stephenson now took the lead in railway engineering, became an extensive locomotive manufacturer at Newcastle, a railway contractor, and a great colliery and ironwork owner, particularly at Clayeross. It is recorded of him, that on one occasion, in reply to the curiosity of a stranger lady, he replied—"Why, madam, they used to call me George Stephenson; I am now called George Stephenson, *Esquire*, of Tapton-house, near Chesterfield; and, further, let me say, that I've dined with princes, peers, and commoners—with persons of all classes, from the humblest to the highest: I've dined off a red-herring, when seated in a hedge-bottom, and have gone through the meanest drudgery. I've seen mankind in all its phases, and the conclusion I have arrived at is this, that if we were all stripped there is not much difference!"

We should imagine that this curious lady must have been most perfectly satisfied with Mr. Stephenson's laconic, but withal truthful, answer to her rude question.

I daresay the thought was, even to the mind of George Stephenson, very singular that the time should speedily come, and he be the hastener of that time, when carriages, even as Mother Shipton is said to have foretold, should run without horses: but so it was to be. And, stranger still, the notion to the country folk, that a thing of brass and iron, fed on coals and water, should do the work of living horses; and that, instead of trundling heavily over the road in a covered cart, stopping for awhile to let Anvil, the farrier, see that sleepy Dobbin's shoes were all right, they should be taking a third or second-class return, and whirling through the air as though shot out of a cannon. "Gi' me a'ter a'," many an old farmer has been heard to say,

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