The Newest Locomotive

Invention

The cover illustration this week is of the replica of the famous English locomotive, the "Rocket," which has been made for the Ford Museum at Dearborn, Mich. The following extracts from an article in a leading British engineering journal describe some of the circumstances under which it was made.

L. P. in *The Engineer*:

One of the pleasures of having more money than you know what to do with is that you may do things which others with a smaller coefficient of superfluity may or must regard as not worth while. America is the fortunate possessor of several such men, amongst whom is included Mr. Henry Ford. The world thinks of Mr. Ford as a hard-headed, very practical business man and nothing more. As a matter of fact, he is a complete American, by which we mean that he has a pronounced sentimental side to his character. Although the most up-to-date man in business that one could meet, it is amongst his ambitions to preserve the records of the past. He has saved old inns and houses from destruction by removing them bodily, and he has opened at Detroit a museum. He is also, we must add, the possessor of a railway, on which the British tradition of beautiful and well-kept rolling stock and locomotives is maintained. It is setting an example to American railways which till now have never paid any attention at all to the appearance of their engines. How far the fact that he is now a railway man is responsible for his desire to acquire a perfect replica of the "Rocket" of Rainhill for his museum, we cannot say; we only know that some months ago he instructed the original builders, Robert Stephenson and Co., Ltd., of Darlington—it used to be R. Stephenson and Co., and the works were then in Newcastle—to make one as like as two peas that which carried off the prize of £500 in 1829.

If, as we are sure it must have been, a pleasure to Mr. Ford to give a *carte blanche* order to Stephensons to build once again—for that is what it came to—the most famous locomotive in history, imagine what a pleasure it must have been to Stephensons to carry out that order. Figure for yourself the bustling and excitement in the office, the hunting up of old drawings and books and manuscripts, the questioning amongst old workpeople about the workshop methods of "Geordy's" day, the consultations with antiquarians of engineering, the arguments and debates about materials, and the anxious research into the great problem of the "Rocket"—her lost fire-box. Such opportunities do not come to a firm once in ten centuries. Museums have built models, replicas of a kind have been made of old machines, but never before, we believe, has an exact duplicate, duplicate as to methods, materials and mistakes, been constructed. It was not an easy thing to do, but it has been done, and it is possible to say, with almost absolute certainty, that the new "Rocket" is so like the first "Rocket" that its own father would not know them apart. . . .

In mechanical invention nothing ever happens just as you expect. Until a thing has been made and tried it is unsafe to say that it will work—or won't. Sometimes surprising success ensues, sometimes the least probable thing goes wrong. When one looks at the "Rocket" as she ran triumphantly at Rainhill and projects oneself backwards into the excitement of those October days, the heart comes into the mouth. Will she stay the course? Will the boiler burst, the seams open, the chimney fall, or the cylinders break bodily away from their doubtful hold upon the boiler? What a dreadful position, to our modern eyes, those cylinders are in! Not dreadful because of their inclination, though that offends us, but because they seem to be floating in the air, and at every stroke they wrench themselves to and fro, straining at the two stays and the few bolts which hold their entablatures to the flimsy fabric of the boiler. Look at the end view as it is given; remember that the cylinders are 3 ft. 7¾ in. center to center; notice the total absence of adequate support, and then ask yourself would you like to stand on a narrow footplate hurtling through the air at thirty miles an hour with your nose just between them. The prize well won, the Stephensons must have been glad enough to get their engine safely home and set about considering how to tie those cylinders more firmly to their base, though they appear to have been left where they were for many months. Mr. Goodall thinks that is why they were lowered to the almost horizontal position which they now occupy at South Kensington. It was not a flash of genius which anticipated the future and broke boldly from almost traditional vertical or steeply inclined positions, but the impulse of necessity. They *had* to be made fast; that was the first need. It was easy to do that by bringing them down from their exalted but precarious height. Earlier Stephenson engines, the famous "Lancashire Witch" amongst them, had inclined cylinders, but they were not designed for high speeds. The "Rocket" was different. We shall never know the truth of the matter. Down they came, and an engine which had a transcendent mechanical fault —you must see it to appreciate it— not only was improved out of recognition mechanically, but established once and for all the right attitude of the cylinders of locomotives. . . .

The "Rocket" runs like a motor car and calls for some of the same driving skill, which her new driver, inspired perhaps by the shade of Dewrance, has quickly acquired. Reversing is a tricky business. The gab rods have to be lifted off their pins, a pedal has to be pressed, and the gabs have to be dropped again upon their pins, all in proper sequence. It takes a little learning. . . .

The long U tube beside the chimney is the mercury pressure gauge. In the extended limb a wooden rod floats in the mercury and the upper end of it slides over a white board marked with the pressure.

The tender speaks for itself; a beautiful job with the horn plates and axle-boxes looking almost too good to be true. It is interesting, again, to notice the difference between the design of the woodwork—there were lots of expert cart builders—and the ironwork. The latter seems to be feeling its way, whilst the former was quite confident. The total absence of brakes is rather curious; one would have expected to find them on the tender at least. How did she stop when she ran light at 29½ miles per hour, just to show what could be done? . .

When one is developing an engine or machine it builds up under the hand. You can't make a general arrangement. Drawings of parts may be got out, but in the assembly modifications and alterations become necessary. So it was with the "Rocket"; she grew under the hands of her builders and no complete contemporary drawing exists. There are lots of drawings, but they were made subsequently and after modifications of this and that had been carried out. At last, through the fine spirit of Mr. Henry Ford and the devotion of the old firm, we know what the "Rocket" was like at Rainhill.