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MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No. 1487	Press
549-50.	~~Mis.~~
Dated 31- 5- 1871 .	

Not to be folded or roughly handled

H.D.
[Signature]

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*Proceedings of the Madras Government, Public Works Department,
31st May 1871.*

No. 549. Read the following Circular from the Government of India, Public Works Department, (Railway,) dated Simla, 9th May 1871, No. 5-R:—

Madras.
Bombay.
Bengal.
N. W. Provinces.
Punjab.
Central Provinces.

Oudh.
British Burmah.
Mysore and Coorg.
Hyderabad.
Central India.
Rajpootana.

COPY of the following letter forwarded for information to the Local Governments and Administrations noted in the margin, in continuation of Circular No. 15, Railway, dated the 20th July 1870,

By Order,
(Signed) ALFRED H. VAUX,
Under Secy. to the Govt. of India.

From the Locomotive and Carriage Superintendent, Oudh and Rohilkhund Railway, to the Agent, Oudh and Rohilkund Railway, dated Lucknow, 3rd March 1871, No. 3,071.

In reply to your No. 285 of the 23th ultimo, forwarding a copy of the Government Consulting Engineer's letter, No. 2,337, of the 30th December 1870, I beg to say that I had an opportunity of inspecting the working of the Fairlie Bogie system in England.

2. In February or March 1866, I reported for the Imperial Mexican Railway Company on an engine then working on the Neath and Brecon Railway, the name of which I cannot now remember, but the "Progress," so often mentioned in the Fairlie experiments, was then on the same Railway, but under thorough repair and alteration, so that I did not have the opportunity of seeing it in steam. The engine I inspected and experimented with was smaller than the "Progress." The wheels were only four feet in diameter.

I was requested to report upon this engine for the purpose of ascertaining whether it would answer for working the very heavy inclines of the Sierra, which is or was then designed to be 1 in 25 for a distance of 25 miles. I was at considerable trouble to get at the actual merits of this engine. It was badly designed. The inventor and constructors had fallen into a grievous error in designing the boiler, which I discovered and pointed out. At that time the boiler had only one fire box, and each set of tubes were carried from either end to the two chimneys. Instead of the fire box being too small, as Mr. Fairlie told me I should find it, I discovered the heating surface to be ample, and I at once suggested to Mr. Holt, then the Locomotive Superintendent of the Neath and Brecon Railway, that dividing the fire box with fire bricks would make the boiler efficient. This was done with perfect success, since which time engines of this kind have afforded plenty of steam; but they are now made with a water space or partition across the centre of the fire box, and are fired by two doors, one for each fire box. There were then many defects in workmanship; the swivelling steam pipes were far from perfect as well as many minor details, which have since been much improved.

The performance of the engine up the steep gradients and round the curves was satisfactory, and I reported accordingly, and said that I considered such an engine suitable for the Mexican inclines. I mention the circumstances connected with this report to show that I have had opportunities of making myself thoroughly

acquainted with this engine. I have taken much interest in Mr. Fairlie's engines from their first introduction, and have since carefully watched their progress. When I was in England I saw the "Little Wonder" on the Festiniog Railway, and made myself thoroughly acquainted with all the recent improvements. I also saw the engines under construction in the works of Messrs. Sharp, Stewart and Company of Manchester, for Russia.

3. The Fairlie Engine is undoubtedly a step in the right direction for certain kinds of Railways. It is well adapted for a narrow gauge, because the length is no object, and, when sharp curves abound, it is perfection.

On a practicably straight and level line like the Oudh and Rohilkhund, I cannot discover its advantages.

4. With the rolling stock at present in use, it must be apparent to every one that it is only practical to work trains of a certain length; 30 to 35 vehicles is, I think, the maximum. To run longer trains, stronger under-frames and drawbar tackle would be indispensable, and, as these are the heaviest parts, the tare would therefore be much increased.

5. The Fairlie Engine is, in reality, a double engine, and on the 5 feet 6 inches gauge would have very nearly the same wheel weight as our ordinary engines, to be thoroughly effective. It is quite true that $3\frac{1}{2}$ tons on a wheel can be obtained, but then comes the complication of a double set of engines without obtaining the amount of adhesion necessary to make it successful.

If we had a "Progress" on this line, it would take a train of 60 vehicles; but I do not consider it prudent to run trains of such a length, for the reasons I have already stated; besides, in the event of our trains not coming up to that number, we should have an expensive and complicated engine only working (to say) two-thirds of its power, which amounts to the same thing as paying a man to do a boy's work.

6. The economy of fuel, as shown by Mr. Fairlie, does not satisfy me. His trials on the Festiniog line were made against a class of engine by no means conspicuous for economy, their fire boxes are very small, and tubes very short. If the actual consumption were taken, and compared with the best designed engines of the present day, the results would not be found quite as good as Mr. Fairlie represents them to be on the Festiniog Railway. It must be borne in mind that a well-balanced rigid engine like our small ones, working on a practically straight line, offers no more resistance than a "Fairlie," and, with a long-wheel base, does not hammer the rails like the "Welsh Poney" or others, with an excessively short wheel base, and overhanging fire box. It is the latter which principally causes the hammering or jumping.

7. I may briefly state that my opinion is against any experiment with the "Fairlie Engine" on this Railway, or any other having a 5-6 gauge, unless it has gradients of 1 in 100 with numerous curves of short radius.

8. I think, however, that the Government would do well to try the system on their narrow gauge lines; but they must make Mr. Fairlie keep down the weight of his engines, or else they will find themselves like the Festiniog Company, with more power than they know what to do with. Two Bogies with cylinders attached to one only would make a capital engine for light Indian Railways.

9. With respect to double Bogies for rolling stock, I beg to observe that they are also to be recommended when there are very sharp curves; and, even in some cases, on straight lines where the gauge is narrow, because they facilitate the arrangement of a commodious vehicle; but on a 5 feet 6 inches gauge, and a practically straight line, they do not appear either necessary or desirable. Passenger vehicles 30 feet long on four wheels are perfectly safe, and are much cheaper in first cost and maintenance than Bogies; when there is no actual necessity for Bogies for the reasons I have named, there is no advantage to be derived from their use.

10. I trust this letter will convey clearly my views, and at the same time convince you that I am in no way prejudiced against Mr. Fairlie's system or the application of the Bogie generally, but, on the contrary, that what I have written has emanated from a fair consideration of the subject.

No. 550.

ORDER THEREON, 31st May 1871, No. 1,487.

RAILWAY, No. 74.

COMMUNICATED to the Consulting
Engineer for Railways, in continuation
of G. O., No. 2,069, dated 26th August
1870.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Acting Consulting Engineer for Railways.

Exd. E. C. Shunker.

GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.
RAILWAY.

To

CIRCULAR No. 5 RAILWAY.

Dated Simla, 9th May 1871.

Received 19th May/71.

Railways in continuation of No. 2069 of 26th April 1870.

Forwards copy of a letter from Mr. Cooke, Locomotive Superintendent, Oudh and Rohilkhand Railway, regarding the working of the Fairlie Engines in England.

No. 1487.

In continuation of Circular No. 15 R of 1871 forwards copy of a letter from Mr. Cooke, Locomotive Superintendent, Oudh and Rohilkhand Railway, regarding the working of the Fairlie Engines in England.

No. 1487 21st May 1871.

W. H. ...

To
Genl Secy for Railways

East of India
31st May/71

Recd 19/71

H.

N.

22 May 1871

