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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. <u>7</u>	Press Mis.
<u>13-14</u>	
Dated <u>11-11-43</u>	18 <u>67</u>

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
4th January 1869.*

No. 13. Read the following Proceedings of the Government of India, Public Works Department, (Railway,) dated Simla, 5th November 1868, No. 1,313 R.

Carrying capacity of Waggon-stock on Indian Railways.

Read again —

Public Works Department Resolution Nos 648—52 R, dated 15th June 1868

Read also. —

Letter from the Government of Madras, No 3,209, dated 12th October 1868, and enclosures

OBSERVATIONS.—In paragraph 5 of Public Works Department Resolution Nos 648—52 R of 15th June 1868, in reviewing the measures that had been taken by the several Railway Companies for improving the carrying capacity of waggons, the Government of India observed “the Locomotive Superintendent of the Madras Railway Company see difficulties in the way of improvement. The existing waggons carry about one ton more than their own weight, but the climate, the ballast, and the bad greasing of the axles are urged as obstacles. The introduction of the improved oil-box referred to by the Superintendent has, it is believed, been attended with considerable success. No other improvement is at present proposed; but the interest evinced by the Officials of other Companies in the importance of the issue, which the papers under consideration attest, will, perhaps, stimulate Mr. Wright to re-consider the practicability of further improvements.” In the papers now read, Mr. Wright explains that he did not intend to be understood to imply that there were “difficulties in the way of improvement,” but that a modified axle-box to existing stock would enable them to carry greatly increased loads. And the Madras Government, in submitting these papers, observe that the waggons which have been provided with the improved axle-boxes introduced by Mr. Wright, are capable of carrying nine tons of paying load to five tons of dead weight, and this favorable result has been attained at so trifling a cost as Rupees 20 per waggon. The Government of India fully concurs in the opinion that great credit is due to Mr. Wright for the introduction of these improved axle-boxes, and it has already been suggested to the Government of Madras, to request the Agent of the Company to communicate the particulars of the improved oil-box to other Indian Railway Companies, and it is understood that this will be done as soon as a patent has been secured for it.

ORDER—Ordered, that a copy of these Observations, and of the papers read, be communicated to the Local Governments and Administration noted in the margin.

Ordered also, that a copy of these Observations be forwarded to the Government of Madras for information

(Signed) J. W. ALEXANDER, C. E.,
Offg. Asst. Secy., for Secy. to the Govt. of Ind.

Secretary to the Government of Madras, Public Works Department, (Railway)

*Proceedings of the Madras Government, Public Works Department,
4th January 1869.*

Enclosure to Railway No 1,309—13 R of 1868.

From the Resolution,—By the Government of India, Public Works Department, dated 15th June 1868, Nos. 618-52 R

Read again.—

Public Works Department Circular No 9 R of 2nd September 1867, to Local Governments
From Government of Bengal, No 1,838 G, dated 25th September 1867, and enclosures.

To " of " " 882, " 8th October "
From " of Punjab, " 176—160, " 29th November " and enclosure.
To " of " " 1,030 R, " 9th December "

Read also.—

From Government of Madras, No 97, dated 11th January 1868, and enclosures

" " of Bombay, " 303, " 21st February " and enclosure.

" " of " " 411, " 28th " " "

" " of Bengal, " 505 G, " 26th March " and enclosures

" " of Punjab, " 104 P—108 D, dated 20th April 1863, "

OBSERVATIONS.—In September 1867, the Government of India drew the attention of Local Governments to the importance of increasing the carrying capacity of waggon stock on Indian Railways, and requested a report of the modifications that could be at once made for increasing the ratio of paying load to dead weight.

2. On the East Indian Railway, it is explained that want of strength, not want of capacity, is the defect of the existing stock, and, with a judicious promptness, measures have been taken for fitting a hundred waggons with an extra pair of wheels, by which a waggon weighing 7 tons shall be enabled to carry 9 tons. It has been also resolved to stop the further construction of waggons until stronger axles are obtained from England.

3. On the Eastern Bengal Railway, the carrying capacity of waggons has been increased, since 1864, from 675 to 1,069 cubic feet, or 58 per cent, and recently the load of a waggon has been increased, and the speed of goods trains correspondingly diminished.

It is proposed still further to increase the load, and, if necessary, to reduce the speed, in order to prevent axles heating. Waggons weighing on an average 4 tons 18 cwt. are to carry 8 tons, affording a satisfactory ratio between dead and paying weight.

The practice obtaining on this Railway of loading waggons partly with heavy, and partly with light goods, so as to secure full weights, is one deserving of attention.

4. The Locomotive Superintendent of the Great Southern of India Railway is quite alive to the importance of the question, and proposes, by strengthening the springs at a small expense, to increase the paying load of waggons from an average of 4 tons 14 cwt. to 6 to 8 tons. This will be a satisfactory improvement.

5. The Locomotive Superintendent of the Madras Company sees difficulties in the way of improvement. The existing waggons carry about one ton more than their own weight, but the climate, the ballast, and the bad greasing of the axles are obstacles. The introduction of the improved oil-box, referred to by the Superintendent, has, it is believed, been attended with considerable success. The improvement is at present proposed; but the interest evinced by the officials in the importance of the issue, which the papers under

*Proceedings of the Madras Government, Public Works Department,
4th January 1869.*

attest, will, perhaps, stimulate Mr. Wright to re-consider the practicability of further improvements.

6. On the Great Indian Peninsula Railway, the Agent, General Rivers, and the Company's Consulting Engineer, Mr. Berkeley, have, after consultation, decided upon constructing 25 waggons of iron, to weigh 5 tons, and carry a 7 ton load. Further, General Rivers has ordered an additional pair of wheels to the existing low-sided waggons.

7. The waggons on the Bombay, Baroda and Central India Railway carry one and a half times their own weight, and thus the Agent considers sufficiently good. The Consulting Engineer differs in opinion, and suggests the introduction of an arrangement which has been adopted on the Sindh Line with success. The subject of introducing six-wheeled waggons on the Bombay, Baroda and Central India Railway has also attracted attention.

8. The answer from the Punjab Government is to the effect, that though waggons can contain from 8 to 10 tons of ordinary goods, the springs and axles are too weak to admit of a greater load than 6 tons. The waggons weigh about 5½ tons.

The Consulting Engineer, therefore, has suggested the desirability of strengthening the springs, the axles, and the journals of the axles.

9. The Governor General in Council has noticed with satisfaction the evidence afforded in these papers of the attention that has been at once directed to the improvement of the ratio between the dead and paying load of goods' vehicles, and trusts that the serious importance of the subject, more specially on lines on which the up and down traffic are very unequal, will ensure for it a sustained attention. A report on the results of the alterations that may be made should be submitted for information, after a sufficient period has elapsed for forming an opinion.

10. The Secretary of State will be requested to obtain the best and most recent information on the subject, with a view to its application when new rolling-stock is added, but the improvement of existing stock should not, in the meantime, be lost sight of.

ORDER—Ordered, that a copy of these Observations, and of the papers read, be communicated to the Local Governments noted in the margin.

Madras	Bengal
Bombay.	Punjab

Ordered also, that a copy of the whole of the correspondence be forwarded to the Chief Commissioner of Oudh for information.

From the Secretary to the Government of Madras, in the Public Works Department, (Railway Branch), to the Secretary to the Government of India, Public Works Department, dated 12th October 1868, No 3,209

With reference to the remarks of the Government of India in paragraph 5 of their Proceedings of the 15th June 1868, No 648 R, upon the report of the Locomotive Superintendent of the Railway Company, regarding the introduction of improvements for increasing the ratio of load to dead weight of waggons, I am directed to forward herewith, a letter from the Commissioner for Railways, giving cover to one from Mr. Barton Wright, in which that gentleman has further particulars to elucidate his former report.

I observed that the waggons which have been provided with the improved axle-boxes, Mr. Wright, are capable of carrying nine tons of paying load to five tons

*Proceedings of the Madras Government, Public Works Department,
4th January 1869.*

weight This favorable result has been attained at so trifling a cost as Rupees 20 per waggon, and the Government of India will, it is presumed, concur in considering that it reflects the greatest credit upon Mr. Wright.

29th September 1868, No 3,067

on the Madras Railway with the "altered keep"

3 A separate application has been submitted for fitting the whole of the waggons in use

From the Acting Consulting Engineer for Railways, to the Secretary to the Government of Madras, in the Public Works Department, Railway Branch, dated 12th September 1868, No. 325

With reference to the Order of Government, No 2,217, dated 11th July 1868, and the observations of the Government of India, conveyed in their Proceedings, No 648 R, dated 15th June 1868, I have the honor to submit, for the information of Government, letters from the Agents of the Madras* and Great Southern of India†

* No 893, dated 11th September 1868

† " 2,712, " 3rd " "

Railways, giving cover to the Reports of the Locomotive Superintendents, on the subject of increasing the carrying capacity of Railway waggons on their respective lines

2 The Locomotive Superintendent of the Madras Railway, by a modification of the axle-boxes, has so improved some of the waggons, at a cost of Rupees 20 per vehicle, that they can carry fifty per cent more paying load than they could formerly. A high-sided open goods wagon can now carry nine tons of goods instead of six tons. It is intended to alter all the old axle-boxes when the vehicles enter the workshops for repair. The modified axle-boxes have the advantage over ordinary oil-boxes, in that either oil or grease may be used in them as the lubricator.

3. It is hoped, that the Government of India may be induced to concur with the Madras Government in the encomiums passed on the energy of Mr Barton Wright, as displayed in his successful endeavors to increase the ratio between the paying and the dead load of goods vehicles.

4 The Locomotive Superintendent of the Great Southern of India Railway awaits the arrival of iron-work from England, and the erection of a spring furnace, without which he is unable to construct an experimental truck intended to weigh five and three-quarter tons, and to carry ten tons.

From the Agent and Manager of the Madras Railway Company, to the Acting Consulting Engineer for Railways, Madras, dated 11th September 1868, No 393.

In continuation of my letter of the 9th instant, No. 386, I have the honor to submit copy of a very able Report† from the Locomotive Superintendent, arising out of the observations of the Government of India, as made known in paragraph 5 of their Proceedings, dated Simla, 15th June 1868, No 648 R, on the subject of increasing the carrying capacity of waggon stock

2. I have had occasion more than once to bring prominently before the Madras Government the energy which Mr. Wright has displayed in his endeavors to improve the ratio between the dead and the paying load of goods vehicles, and I can but express a hope that Mr Wright's Report, now submitted, will remove any impression to the contrary which the Supreme Government may have formed.

From the Locomotive Superintendent, Madras Railway, to the Agent and Manager of the Madras Railway Company, dated 7th September 1868, No 201,

Letter from Consulting Engineer, No 211, dated 15th July 1868

Order of Madras Government, No 2,217, dated 11th July 1868

Proceedings of Government of India, in Public Works Department, Railway, No 648 R, dated 15th June 1868

With reference to the correspondence note the margin, I beg to submit the following remarks

2 In the 5th paragraph of the "Observations" contained in the Proceedings of the Government of India, dated 15th June

it is stated, "that the Locomotive Superintendent of the Madras Company, in view of improvement. The existing waggons carry about one ton more than the rate, the ballast, and the bad greasing of the axles are urged as obstructions."

*Proceedings of the Madras Government, Public Works Department,
4th January 1869.*

duction of the improved oil-box, referred to by the Superintendent, has, it is believed, been attended with considerable success. No other improvement is at present proposed, but the interest evinced by the Officials of other Companies in the importance of the issue, which the papers under consideration attest, will, perhaps, stimulate Mr Wright to re-consider the practicability of further improvements."

3. It is evident by the above observations that what I wished to express in my letter, No. 186, dated 3rd October 1867, has not been understood, and I regret that I should have failed to render my meaning sufficiently clear.

4 In my letter referred to, I most certainly do not say that I see "difficulties in the way of improvement," nor can I discover any sentence which can be taken as implying that I do so; on the contrary, after, in the first four paragraphs of my letter, strongly expressing my opinion as to the importance I attach to this subject, I go on to show that, although I consider that it is inexpedient to reduce the weight and consequent strength of our present waggons, I believe that a modified axle-box will enable us to carry greatly increased loads, and I further state, that I have arranged to make the alterations I suggest to a waggon, the results of the experiments with which I communicated in my subsequent letter, No 15, of 23rd January 1868

5 Finding this alteration so successful, and seeing that the discarding of the old grease-boxes and the substitution of oil-boxes, would be attended with a very considerable expenditure, I fitted up a set of oil-keeps to the old muster grease-boxes of one of our waggons, and sent it out on the line for trial with a load of nine tons weight, and as it was found that it and other waggons so fitted run cool with loads of this weight, (nine tons), which they have been regularly carrying for some time past, I have arranged to fit up all old waggons coming in for repairs, and all waggons, old or new, going out of our workshops, with this description of keep.

6. The cost of the alteration amounts to about Rupees 20 per waggon, and the grease-box with this modification has, beyond its moderate cost, an advantage over the ordinary oil-box, inasmuch as it can be used either for oil or grease, as may be found necessary, so that, whether other Railways adopt the use of this description of box or not, there is now no objection to its general adoption on our line, as grease could be used instead of oil when required in running over other lines

7. I consider, therefore, that we have arrived at very good results, now that we are able to carry nine tons of paying load to five tons of dead weight.

8 Our platform and low-sided waggons, weighing four tons, ten cwt. to four tons, fifteen cwt, can carry, when fitted with the modified axle-box, paying loads of nine tons, ten cwt and nine tons, five cwt respectively.

9. Our Traffic Manager considers that, with the recent improvements in the weight-carrying capacity of our rolling-stock, we can have no description of vehicle better suited to the circumstances of our traffic than our present high-sided open goods; such being the case, I consider that it would be an unnecessary expense to attempt to alter our existing stock.

10 I do not say that improvements could not be made in the construction of entirely new but that is a question quite apart from that of doing the best we can with that which we have, and which was, as I understood it, the point referred to in the question originally asked of India, when writing on this subject, in the following words, "what arrangements made for improving the carrying capacity of the existing waggon stock." The meaning under the words "at once" and "existing" is mine, and I emphasize it would appear by the correspondence that alterations of a very different kind were apparently contemplated in the original communication on this subject" of the Supreme Government

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4th January 1869.*

12 In paragraph 2 of the observations, it is stated that "on the East Indian Railway, it is explained that want of strength, not want of capacity, is the defect of the existing stock, and with a laudable promptitude, measures have been taken for fitting a hundred waggons with an extra pair of wheels, by which a waggon weighing seven tons shall be enabled to carry nine tons. It has been also resolved to stop the further construction of waggons until stronger axles are obtained from England "

13 The correctness of the position I have taken up, as to the undesirability of reducing the weight and consequent strength of our waggons, is here borne out and admitted; but, although I consider that it would be decidedly inexpedient to attempt to arrive at the desired results by lessening the weight and strength of the stock, I am of opinion, that the waggons on our line are strong enough to carry as much weight as the axle bearings will run cool under. The amount of weight up to which the waggons can be loaded, without getting hot bearings is, in my opinion, the limit to the loads we can carry. The heating of axle journals is, in fact, so far as my experience goes, our weak point in this country, and the whole solution of the question, as I view it, is summed up by Colonel Orr in his remarks upon the Reports of the Consulting Engineer and Railway officials of this Presidency, in the following words: "Seeing how the dead weight of the waggons cannot be reduced, it is impossible to increase the paying load with safety or advantage, except by providing the waggons with improved means of lubrication." This is my opinion, and that I am correct in the view I take, is borne out, not only by English and Continental practice, (which is to carry loads of nine tons in waggons of similar strength and proportions as those in use on this line), but also by the results of my own experiments. In my letter No 15 of the 23rd January 1868, I report that the trials with the waggon fitted with oil-boxes have been successful, and suggest the expediency of modifying our axle-boxes generally, so as to enable our stock to carry eight or nine tons. I further state, that this can be accomplished (by simply renewing the keeps), at so small a cost as will be very soon repaid by the advantage which will accrue from the increase of freight which our waggons will then be enabled to carry, therefore, although the Government Consulting Engineers and the Officers of other Railways may have reasons, and good ones, for holding different views and opinions to my own on this subject, I am at a loss to understand why, (when taken in connection with the facts set forth, and the views generally expressed throughout this correspondence), the result arrived at, namely, the carrying of nine tons in a waggon weighing seven tons, by so costly an expedient as that of adding an extra pair of wheels to a vehicle, should be considered a subject for laudation, nor, with the above facts before me, do I see the grounds on which reflections are made upon my proposal to endeavour to attain the wished-for results by a comparatively trifling and inexpensive alteration, the adoption of which has enabled us to carry, as already stated, loads of nine tons in waggons weighing only five tons.

14 The proposal to construct 6-wheeled waggons appears, by the papers before me, to have met with general approval, but looking to the character of our traffic, I should hesitate to recommend the introduction of this description of vehicle, excepting for special purposes, such as carrying heavy machinery, or masses, which 4-wheels are unable to bear, and it would be simply throwing money away to put 6 wheels under existing vehicles, which are not usually likely to get goods of so great a specific gravity as to admit of waggons being loaded up to their weight-carrying capacity.

15 Should any 6-wheeled waggons be required for our traffic, I estimate that I can construct a waggon, 22 feet long by 8 feet 2 inches wide, that will weigh six tons fifteen cwt, and which, fitted with three pairs of our present wheels and axles, will carry a load of thirteen tons ten cwt, or its own weight.

16 I observe in the Proceedings of the Government of India, that it is, in some instances, to strengthen the springs and axles. The former is a comparatively and cheaply effected, and one which must necessarily be made, where the stock is not strong to carry the maximum load. The strengthening of the axles is a more costly and expensive matter, and will necessitate the discarding of present axle

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4th January 1869.*

ment by new ones. This will also involve the boring out, and consequent weakening of the bosses of the wheels, and the increased diameter or length of the journals will involve new brasses, new axle-boxes and axle-guards, with alterations to bridle rods, &c

17 A strong axle and a large journal is no doubt a very important desideratum, being not only an element of increased strength and safety in cases where great weights have to be carried, but affording the further advantage of a greater bearing surface, and consequently, less risk of heating, but taking into consideration the general nature of our traffic and our whole circumstances, I much question whether these advantages would adequately compensate us for the enormous expense and sacrifice such an alteration would entail.

18 As I am about to return to England by the next steamer, I shall have the opportunity of making myself acquainted with the best and latest practice in such matters, both as obtaining in England and on the Continent of Europe. I shall also have the advantage of consulting and conferring with Mr Hawkshaw, who will, no doubt, advise the Board as to that which is most conducive to their interests.

19 In conclusion, I trust I may be pardoned when I state, that I can see nothing in the papers before me to account for the remark that "the interest evinced by the Officials of other Companies in the importance of the issue, which the papers under consideration attest, will perhaps, stimulate Mr Wright to re-consider the practicability of further improvements." You are well aware, that I have from the first, been fully alive to the importance of this question of improving the weight-carrying capacity of our waggons, and that I have given it my constant and earnest attention. The Government Consulting Engineer can, no doubt, also bear testimony to this fact. I had hoped that my report and letters on this subject would have carried the conviction of my interest therein to the minds of those reading it, instead of producing, as it appears to have done with the Supreme Government, a contrary impression, but setting aside all personal feeling in the matter, I cannot understand why, in the one case, praise should be meted out to the Officers of a Company who, at a great additional expense, produce a waggon carrying two-sevenths more paying load than its own weight, nor why, on the other hand, unfavourable reflections should be passed on those of another Company, who, at a trifling expense, have succeeded in making their existing stock carry four-fifths more paying load than its own weight.

From the Agent of the Great Southern of India Railway, to the Consulting Engineer for Railways,
Madras, dated 3rd September 1868, No 2,712

With reference to your letter No 222, dated 29th August 1868, relative to "the improvement of the ratio between the dead and the paying load of goods carriages," I send for your information, copy of a letter, No 1,079, from the Locomotive Superintendent.

From the Locomotive Superintendent, Great Southern of India Railway, to the Agent of the Great Southern of India Railway, dated 2nd September 1868, No 1,079.

Your No 5,942.

The above referring to Consulting Engineer's letter No 222, I cannot do anything in this matter until I get the spring furnace erected, which I intended for some three months since. The work has been out here nearly four years. I have as much work as I can do to keep the present, but when I get the furnace, I have sanctioned for from a Spring-maker from about increasing the strength of the springs to enable our truck to carry eight tons. The iron-work for the new stock will be out in October, when I propose construct a truck to weigh five and three quarter tons and carry ten tons.

The timber ready for this, and await the iron-work.

*Proceedings of the Madras Government, Public Works Department,
4th January 1869.*

No. 14

ORDER THEREON, 4th January 1868, No 7.

RAILWAY, No. 1.

Communicated to the Consulting
Engineer for Railways.

(True Extract)

Colonel, R E,
Secretary to Government.

To the Consulting Engineer for Railways

Enclosure to Railway No. 1309—13 R of 1868.

Nos 648—52 R, dated 15th June, 1868.

RESOLUTION,—By the Government of India, P. W. Dept

Read again :—

Public Works Department Circular No 9 R of 2nd September 1867, to Local Governments
From Government of Bengal, No 1838 G, dated 25th September 1867, and enclosures
To " of " " 882, " 8th October " and enclosure
From " of Punjab, " 176—160, " 29th November " and enclosure
To " of " " 1080 R, " 9th December "

Read also :—

From Government of Madras, No 97, dated 11th January 1868, and enclosures
" " of Bombay, " 363, " 21st February " and enclosure.
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OBSERVATIONS —In September 1867, the Government of India drew the attention of Local Governments to the importance of increasing the carrying capacity of wagon stock on Indian Railways, and requested a report of the modifications that could be at once made for increasing the ratio of paying load to dead weight.

2. On the East Indian Railway, it is explained that want of strength, not want of capacity, is the defect of the existing stock, and, with a laudable promptness, measures have been taken for fitting a hundred wagons with an extra pair of wheels, by which a wagon weighing 7 tons shall be enabled to carry 9 tons. It has been also resolved to stop the further construction of wagons until stronger axles are obtained from England.

3. On the Eastern Bengal Railway, the carrying capacity of wagons has been increased, since 1854, from 675 to 1,069 cubic feet, or 58 per cent, and recently the load of a wagon has been increased, and the speed of goods trains correspondingly diminished.

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Superintendent of the Great Southern of importance of the question, and prop small expense, to increase the p tons 14 cwt. to 6 to 8 tons. T

5. The Locomotive Superintendent of the Madras Company sees difficulties in the way of improvement. The existing wagons carry about 1 ton more than their own weight, but the climate, the ballast, and the bad greasing of the axles are urged as obstacles. The introduction of the improved oil-box, referred to by the Superintendent, has, it is believed, been attended with considerable success. No other improvement is at present proposed; but the interest evinced by the officials of other Companies in the importance of the issue, which the papers under consideration attest, will, perhaps, stimulate Mr. Wright to re-consider the practicability of further improvements.

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7. The wagons on the Bombay, Baroda and Central India Railway carry one and a half times their own weight, and this the Agent considers sufficiently good. The Consulting Engineer differs in opinion, and suggests the introduction of an arrangement which has been adopted on the Sindh Line with success. The subject of introducing 6-wheeled wagons on the Bombay, Baroda and Central India Railway has also attracted attention.

8. The answer from the Punjab Government is to the effect that though wagons can contain from 8 to 10 tons of ordinary goods, the springs and axles are too weak to admit of a greater load than 6 tons. The wagons weigh about $5\frac{1}{2}$ tons.

The Consulting Engineer, therefore, has suggested the desirability of strengthening the springs, the axles, and the journals of the axles.

9. The Governor General in Council has noticed with satisfaction the evidence afforded in these papers of the attention that has been at once directed to the improvement of the ratio between the dead and paying load of goods' vehicles, and trusts that the serious importance of the subject, more specially on lines on which the up and down traffic are very unequal, will ensure for it a sustained attention. A report on the results of the alterations that may be made should be submitted for information after a sufficient period has elapsed for forming an opinion.

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ORDER.—Ordered, that a copy of these observations, and of the papers read, be forwarded to the Governments in the margin.

Ordered also, that a copy of the whole of the observations be forwarded to the Chief Commissioner of Oudh for his consideration.

From—COLONEL C. A. ORR, R. E., Secy. to the Dept., Railway Branch,

Secretary to the Government of India, P. W. Branch, in reference to the remarks of the Government of India, 15th June 1868, No 648 R, upon the Madras Railway Company, regarding the

increasing the ratio of paying load to dead weight of wagons, I am directed to forward herewith a letter from the Consulting Engineer for Railways, giving cover to one from Mr. Barton Wright, in which that gentleman enters into further particulars to elucidate his former report.

2 It will be observed that the wagons which have been provided with the improved axle-boxes introduced by Mr. Wright, are capable of carrying 9 tons of paying load to 5 tons of dead weight. This favourable result has been attained at so trifling a cost as Rs 20 per wagon, and the Government of India will, it is presumed, concur in considering that it reflects the greatest credit upon Mr. Wright.

3 A separate application has been submitted for fitting the whole of the wagons in use on the Madras Railway with the "altered keop".

29th September 1868, No 3067

No 325, dated 12th September, 1868

From—Acting Consulting Engineer for Railways,
To—Secretary to the Government of Madras, in the P. W. Dept., Railway Branch

With reference to the Order of Government, No 2,217, dated 11th July 1868, and the observations of the Government of India, conveyed in their Proceedings No 648 R, dated 15th June 1868, I have the honour to submit, for the information of Government, letters from the Agents of the Madras* and Great Southern of India† Railways, giving cover to the Reports of the Locomotive Superintendents, on the subject of increasing the carrying capacity of Railway wagons on their respective lines.

2 The Locomotive Superintendent of the Madras Railway, by a modification of the axle-boxes, has so improved some of the wagons, at a cost of Rs 20 per vehicle, that they can carry 50 per cent more paying load than they could formerly. A high-sided open goods wagon can now carry 9 tons of goods instead of 6 tons. It is intended to alter all the old axle boxes when the vehicles enter the workshops for repair. The modified axle-boxes have the advantage over ordinary oil-boxes in that either oil or grease may be used in them as the lubricator.

3 It is hoped that the Government of India may be induced to concur with the Madras Government in the encomiums passed on the energy of Mr. Barton Wright, as displayed in his successful endeavours to increase the ratio between the paying and the dead load of goods vehicles.

4 The Locomotive Superintendent of the Great Southern of India Railway awaits the arrival of iron-work from England, and the erection of a spring furnace, without which he is unable to construct an experimental truck intended to weigh $5\frac{1}{2}$ tons, and to carry 10 tons.

No 333, dated 11th September, 1868

From—R. B. ELLIOT, Esq., Agent and Manager of the Madras Railway Company,
To—Acting Consulting Engineer for Railways, Madras

In continuation of my letter of the 9th instant, No 336, I have the honour to submit copy of a very able Report† from the Locomotive Superintendent, arising out of the observations of the Government of India as made known in para 5 of their Proceedings, dated Simla 15th June 1868, No 648 R, on the subject of increasing the carrying capacity of wagon stock.

2 I have had occasion more than once to bring prominently before the Madras Government the energy which Mr. Wright has displayed in his endeavours to improve the ratio between the dead and paying load of goods vehicles, and I can but express a hope that the observations submitted will remove any impression to the contrary which may have formed.

201, dated 7th September, 1868
Esq., Locomotive Superintendent, Madras Railway,
of the Madras Railway Company

With reference to the correspondence noted in the margin, I submit the following remarks:
dated 15th July 1868
Public Works Department
Observations contained in the Proceedings to 1868, No 648 R, it is stated, "that the any sees difficulties in the way of improvement."

3 It is evident by the above observations that what I wished to express in my letter No 186, dated 3rd October 1867, has not been understood, and I regret that I should have failed to render my meaning sufficiently clear.

4 In my letter referred to, I most certainly do not say that I see "difficulties in the way of improvement," nor can I discover any sentence which can be taken as implying that I do so, on the contrary, after, in the first four paras of my letter, strongly expressing my opinion as to the importance I attach to this subject, I go on to show that, although I consider that it is inexpedient to reduce the weight and consequent strength of our present wagons, I believe that a modified axle-box will enable us to carry greatly increased loads, and I further state that I have arranged to make the alterations I suggest to a wagon, the results of the experiments with which I communicated in my subsequent letter, No 15 of 23rd January 1868

5 Finding this alteration so successful, and seeing that the discarding of the old grease boxes and the substitution of oil-boxes, would be attended with a very considerable expenditure it out on the line for trial with a load of 9 tons weight, and one of our wagons, and other wagons so fitted run cool with loads of this weight (9 tons), which they have been regularly carrying for some time past, I have arranged to fit up all old wagons coming in for repairs, and all wagons, old or new, going out of our workshops, with this description of keep

6 The cost of the alteration amounts to about Rs 20 per wagon, and the grease-box with this modification has, beyond its moderate cost, an advantage over the ordinary oil-box inasmuch as it can be used either for oil or grease, as may be found necessary, so that, whether other Railways adopt the use of this description of box or not, there is now no objection to its general adoption on our line, as grease could be used instead of oil when required in running over other lines.

7 I consider, therefore, that we have arrived at very good results, now that we are able to carry 9 tons of paying load to 5 tons of dead weight

8 Our platform and low-sided wagons, weighing 4 tons 10 cwt to 4 tons 15 cwt, can carry, when fitted with the modified axle-box, prying loads of 9 tons 10 cwt and 9 tons 5 cwt respectively

9 Our Traffic Manager considers that, with the recent improvements in the weight-carrying capacity of our rolling-stock, we can have no description of vehicle better suited to the circumstances of our traffic than our present high-sided open goods, such being the case, I consider that it would be an unnecessary expense to attempt to alter our *existing* stock.

10 I do not say that improvements could not be made in the *new* stock, but that is a question not

10 I do not say that improvements could not be made in the construction of entirely new stock, but that is a question quite apart from that of doing the best we can with that which we now have, and which was, as I understood it, the point referred to in the question originally asked by the Government of India, when writing on this subject, in the following words, "what arrangements can *at once* be made for improving the carrying capacity of the *existing* wagon stock"

11 The underlining under the words "*at once*"

11 The underlining under the words "at once" and "existing" emphasize these words because it would appear by the correspondence that alterations of a very different character from those apparently contemplated in the original communication on this subject, have met with the approval of the Supreme Government.

12 In para 2 of the observations it is stated that "The Government

12 In para 2 of the observations it is stated that "on explained that want of strength, not want of capacity, is and with a landable promptitude, measures have been taken with an extra pair of wheels by which a wagon weighing carry 9 tons It has been also resolved to stop the further stronger axles are obtained from England"

13 The correctness of the position I have taken up, weight and consequent strength of our wagons, is, though I consider that it would be decidedly inexpedient by lessening the weight and strength of the stock, line are strong enough to carry as much weight. The amount of weight up to which the wagons can in my opinion, the limit to the loads we can carry, as far as my experience goes, our weak point, as I view it, is summed up by Colonel [Name], Chief Engineer and Railway officials of the

"Seeing how the dead weight of the wagons cannot be reduced, it is impossible to increase the paying load with safety or advantage, except by providing the wagons with improved means of lubrication" This is *my* opinion, and that I am correct in the view I take, is borne out, not only by English and Continental practice (which is to carry loads of 9 tons in wagons of similar strength and proportions as those in use on this line), but also by the results of my own experiments. In my letter No 15 of the 23rd January 1868, I report that the trials with the wagon fitted with oil-boxes have been successful, and suggest the expediency of modifying our axle-boxes generally so as to enable our stock to carry 8 or 9 tons. I further state that this can be accomplished (by simply renewing the keeps) at so small a cost as will be very soon repaid by the advantage which will accrue from the increase of freight which our wagons will then be enabled to carry, therefore, although the Government Consulting Engineers and the Officers of other Railways may have reasons, and good ones, for holding different views and opinions to my own on this subject, I am at a loss to understand why (when taken in connexion with the facts set forth, and the views generally expressed throughout this correspondence), the result arrived at, namely, the carrying of 9 tons in a wagon weighing 7 tons, by so costly an expedient as that of adding an extra pair of wheels to a vehicle, should be considered a subject for laudation, nor, with the above facts before me, do I see the grounds on which reflections are made upon my proposal to endeavour to attain the wished-for results by a comparatively trifling and inexpensive alteration, the adoption of which has enabled us to carry, as already stated, loads of 9 tons in wagons weighing only 5 tons.

14 The proposal to construct 6-wheeled wagons appears, by the papers before me, to have met with general approval, but looking to the character of our traffic, I should hesitate to recommend the introduction of this description of vehicle, excepting for special purposes, such as carrying heavy machinery, or masses, which 4-wheels are unable to bear, and it would be simply throwing money away to put 6 wheels under existing vehicles, which are not usually likely to get goods of so great a specific gravity as to admit of wagons being loaded up to their weight-carrying capacity

15 Should any 6-wheeled wagons be required for our traffic, I estimate that I can construct a wagon, 22 feet long by 8 feet 2 inches wide, that will weigh 6 tons 15 cwt, and which, fitted with three pairs of our present wheels and axles, will carry a load of 13 tons 10 cwt, or double its own weight

16 I observe in the Proceedings of the Government of India, that it is further proposed, in some instances, to strengthen the springs and axles. The former is an alteration which can be easily and cheaply effected, and one which must necessarily be made where the springs are not sufficiently strong to carry the maximum load. The strengthening of the axles is, however, a very serious and expensive matter, and will necessitate the discarding of present axles and their replacement by new ones. This will also involve the buying-out, and consequent weakening, of the bosses of the wheels, and the increased diameter or length of the journals will involve new brasses, new axle-boxes and axle-guards, with alterations to bridle rods, &c

17 A strong axle and a large journal is no doubt a very important desideratum, being not only an element of increased strength and safety in cases where great weights have to be carried, but affording the further advantage of a greater bearing surface, and consequently, less risk of heating, but taking into consideration the general nature of our traffic and our whole circumstances, I much question whether these advantages would adequately compensate us for the enormous expense and sacrifice such an alteration would entail.

18. As I am about to return to England by the next steamer, I shall have the opportunity of making myself acquainted with the best and latest practice in such matters, both as obtaining in England and on the Continent of Europe. I shall also have the advantage of consulting and conferring with Mr. Hawkshaw, who will, no doubt, advise the Board as to that which is most conducive to their interests.

19. In conclusion
ers before me to r
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may be pardoned when I state that I can see nothing in the remark that "the interest evinced by the officials of the issue, which the papers under consideration attest, to re-consider the practicability of further improvement to the first, been fully alive to the importance of the night-carrying capacity of our wagons, and that I have attention. The Government Consulting Engineer can, no doubt, I had hoped that my report and letters on this subject of my interest therein to the minds of those reading to have done with the Supreme Government, a contrainal feeling in the matter, I cannot understand why out to the Officers of a Company who, at a great trying two-sevenths more paying load than unfavourable reflections should be passed or also have succeeded in making their exertions own weight.

(6)

No. 2712, dated 3rd September, 1868

From—Agent of the Great Southern of India Railway,

To—Consulting Engineer for Railways, Madras.

With reference to your letter No. 222, dated 29th August 1868, relative to "the improvement of the ratio between the dead and the paying load of goods carriages," I send for your information copy of a letter, No. 1,079, from the Locomotive Superintendent

No. 1079, dated 2nd September, 1868

From—Locomotive Superintendent, Great Southern of India Railway,

To—Agent of the Great Southern of India Railway

Your No 5942.

The above referring to Consulting Engineer's letter No 222, I cannot do anything in this matter until I get the spring furnace erected, which I indented for some three months since. The furnace itself has been out here nearly 4 years. I have as much work as I can do to keep the stock going at present, but when I get the furnace, I have sanctioned for from a spring-maker from Home, I shall set about increasing the strength of the springs to enable our truck to carry 8 tons. I hope the iron-work for the new stock will be out in October, when I propose constructing an experimental truck to weigh $5\frac{1}{2}$ tons and carry 10 tons.

2. I have the timber ready for this, and await the iron-work.

P.P. 4545/68.

No. 133R

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

RAILWAY.

SIMLA, NOVEMBER 5, 1868.

Carrying capacity of Wagon-stock on Indian Railways.

Read again:—

Public Works Department Resolution Nos 648—52 R, dated 15th June 1868.

Read also:—

Letter from the Government of Madras, No. 3209, dated 12th October 1868, and enclosures

OBSERVATIONS.—In para. 5 of Public Works Department Resolution Nos. 648—52 R of 15th June 1868, in reviewing the measures that had been taken by the several Railway Companies for improving the carrying capacity of wagons, the Government of India observed "the Locomotive Superintendent of the Madras Railway Company sees difficulties in the way of improvement. The existing wagons carry about one ton more than their own weight, but the climate, the ballast, and the bad greasing of the axles are urged as obstacles. The introduction of the improved oil-box referred to by the Superintendent has, it is believed, been attended with considerable success. No other improvement is at present proposed; but the interest evinced by the officials of other Companies in the importance of the issue, which the papers under consideration attest, will, perhaps, stimulate Mr. Wright to re-consider the practicability of further improvements." In the papers now read, Mr. Wright explains that he did not intend to be understood to imply that there were "difficulties in the way of improvement," but that a modified axle-box to existing stock would enable them to carry greatly increased loads. And the Madras Government, in submitting these papers, observe that the wagons which have been provided with the improved axle-boxes introduced by Mr. Wright, are capable of carrying nine tons of paying load to five tons of dead weight, and this favourable result has been attained at so trifling a cost as Rs. 20 per wagon. The Government of India fully concurs in the opinion that great credit is due to Mr. Wright for the introduction of these improved axle-boxes, and it has already been suggested to the Government of Madras to request the Agent of the Company to communicate the particulars of the improved oil-box to other Indian Railways, and it is understood that this will be done as secured for it.

a copy of these Observations, and of the papers read, be communicated to the Local Governments and Administration in the margin.

of these Observations be forwarded for communication.

*C. E., Offg. Asstt.
for Secy. to the Gov*

East

Post Office

Sept 6/70

St. Louis

for Railway -

Communicated & the Meeting for Union

to Jan 1893

to the Secretary for Railway -

W. A.

Sept 6/70

