

(No. 133.)



1884.

PARLIAMENT OF TASMANIA.

**DOUBLE AND SINGLE BUFFERS FOR
RAILWAY CARRIAGES:**

CORRESPONDENCE.

Presented to both Houses of Parliament by His Excellency's Command.



CORRESPONDENCE between the Government and the Manager of the Tasmanian Main Line Railway Company on the subject of Double and Single Buffers for Railway Carriages.

*Tasmanian Main Line Railway Company, Limited,
General Manager's Office, Hobart, 12th October, 1883.*

SIR,

ALTHOUGH the extreme gravity of the question whether or not the new rolling stock ordered for the Launceston and Western Railway when reduced in gauge, and for its extension to Formby, should be directly interchangeable with that used on the Main Line Railway, has engaged my most serious attention, I have hitherto refrained from addressing the Government in the matter, not wishing to set my opinion against that of their advisers; but since Ministers of the Crown in both Houses of the Legislature have asserted that the paramount importance of complete interchangeability has been surrendered because of the inferiority of the Main Line rolling stock to that they have ordered, and have taunted independent Members who expressed a doubt on this point that their questions have been dictated by jealousy of the northern Line having such very superior stock, on behalf of the Main Line Railway Company I feel it my duty to state that the alleged improvement is purely imaginary,—that it is not in accordance with the most modern practice, but a retrograde and disadvantageous alteration therefrom, and that the evils it will cause are immediate and most serious.

It is alleged that the respective rolling stocks can be made interchangeable by certain additions to the new stock, but it is acknowledged that for each truck this operation will require some minutes to perform, and that an ample supply of portable buffers must be kept at the junction. It is therefore clear that trucks cannot possibly be transferred between meeting trains, and that trucks arriving by the Western Line on one day cannot be forwarded by the freight train of the Main Line until the following day, thus practically causing the loss of use of trucks for a day on each occasion of their transfer.

Further, it does not appear to be contemplated that the Main Line rolling stock (increased as it will be by that of the branch Lines along its course, which your professional advisers allow must be furnished with rolling stock interchangeable with that of the Main Line), should be adapted to pass over the Western Line, or work in with the new stock. Therefore, as regards such stock, of which the quantity will probably be four times that of the other, all the horrors of a break of gauge must ensue at the junction, and be additional on the delay of trucks, and loss of time in freighting operations before mentioned. An additional cost in construction will also arise from the necessity of constructing transfer platforms and sidings for the large quantity of extra stock that must always be there.

Another consideration is that fully stated in Mr. R. W. Lord's Memorandum, dated the 18th September last, in which the intense evils of a break of gauge are set forth, also some of the many very costly efforts made to correct it; and it is stated that many low classes of traffic which could be developed by the use of uniform rolling stock could not be fostered at all if saddled with the expense of twice handling; and he instances lime, fencing, stone, artificial manures, of which, as also potatoes, bricks, and timber of all kinds, there should be a large interchange traffic between the two lines.

Further, an inestimable advantage would result to the traffic arrangements of the Launceston and Western Railway on such occasions as the Longford Show, Deloraine Races, and Perth Regatta, if the Manager were able to borrow whole passenger trains, or any number and description of carriages that might be required from the Main Line Company (which, on such days, have always

a large available surplus stock), for which irregular traffic the stock of the Western Line alone is never likely to suffice. Similarly, on special occasions, the Main Line would find it very advantageous to hire any surplus stock of the Western Line.

It is not too much to state that for the rolling stock of the two Lines not being made entirely interchangeable (independently of the prejudicial effect on the traffic of both lines) would be a dire public calamity, the force of which when experienced would require that they be forthwith assimilated.

I now come to the question whether the proposed double buffers are necessary or desirable as being an improvement on the system adopted for the Main Line; and must first premise that of all the rolling stock at present in this world I believe the larger half is worked with the single buffer and drawbar, and that a larger proportion of such is daily added. On the standard gauge of 4 feet 8½ inches and broader gauges, which are laid down with easy curves, double buffers have some advantages, and doubtless continue to be used to a considerable extent, but not with that of American design, which is gradually replacing all others. On the whole American Continent, which owns nearly half the rolling stock of the world, and certainly the best of it, I do not know a single instance of double buffers being used. In these colonies the stock that bears the highest character for general adaptability to requirements is that of New Zealand, where only single buffers are or ever have been used.

The South Australian stock, which has received so much attention from such an eminent authority in these matters as Mr. Mais, has single buffers to its narrow gauge stock, as I am satisfied would obtain in Victoria and New South Wales were not wider gauges used. The new stock (only just received from the best builders in England) for the Van Diemen's Land Company is provided with single buffers, as also are the types of the best narrow gauge stock from time to time described in the professional journals. Queensland has finally adopted double buffers for a 3½ feet gauge, and it is not likely to be followed by any but those who pin their faith to what has been done in that colony. As regards the objections urged against the single buffers (these I can only find described in a letter from Mr. Batchelor to the Hon. Minister of Lands which was read in the House of Assembly), it appears that corner buffers are adopted to ensure steadiness with short vehicles while in motion; but, if I am correctly informed, the new carriages ordered are not short, and therefore, as is afterwards stated, the central buffers are not objectionable. Mr. Batchelor states that with the ordinary central buffing and coupling arrangements, in which, I presume, he includes that used on the Main Line, there is no means of tightening up the couplings, consequently there is a considerable amount of play between the adjacent vehicles of a train, often as much as 6 inches, the effect of which is to lengthen the train and cause a greater expenditure of motive power owing to the increased effect of wind and pressure of the flanges of the wheel against the rail when a train is running through sharp curves. These remarks applied to the Main Line stock are entirely erroneous, as there are special couplings for tightening up the vehicles close to each other, which are invariably used, the buffers always touching, or else being strained on the necessary connecting link to give the indispensable play on the curves.

The pressure of the wind depends simply on the surface exposed, and cannot possibly be affected by the description of coupling; while the pressure of the flanges of the wheels against the rails must necessarily be less the more freely they run round the curves. Certainly the rigidity of a tightly coupled train must vastly increase the difficulty of working it through sharp curves, as also the wear and tear both of wheels and permanent way, &c., while it also augments the tendency of the wheels to mount the outer rail of curves, which is sometimes an almost unaccountable difficulty. The whole of the great and unexpected success which has attended the running of the vehicles of the Main Line at high speed round the sharpest curves is undoubtedly due to their freedom from each other and liberty to play on extra large central buffers, which have been carefully provided.

A second charge is the liability of the couplings to break or become detached in consequence of the train being started and stopped in detail by a succession of sudden and violent jerks, which cause a severe strain upon the draw and buffing springs, acts injuriously upon the permanent way, increases the risk of carrying goods of a fragile nature, and in mixed trains is a source of annoyance to passengers,—which objections are to a great extent obviated by the use of corner buffers. This description as applied to the Main Line arrangement is the most fallacious it is possible to draw, and must arise from a want of consideration of the system of central buffer and drawbar used.

On the corner buffer system the strains both of drawing and buffing are taken at the ends of the vehicles and transmitted through the underframes, and consequently through the vehicles themselves. Any jerk or bump may therefore be said to pass through the seat of the passenger carriage, and must to some extent be communicated thereto. The train, in fact, consists of a string of connected solid blocks, on which goods or passengers are placed, and any sudden force exerted at either end is transmitted almost equally through the whole series. The more tightly the train is coupled the less will the blow be spent in transmission. On the other hand, the couplings of the

Main Line stock form an elastic chain the whole length of the train, and but a very small portion of any force exerted at either end thereof affects any one carriage of the train, and then only through a combination of springs.

When vehicles are properly coupled up the horrors depicted by Mr. Batchelor cannot possibly be experienced. He appears to mistake what may be called the liveliness or quick light action of the vehicles, due to their independence of the full strain, for the dead action of violent blows, which it is simply impossible to give them.

So far from this increasing the annoyance and risk of transport, it must greatly diminish the dangerous effect of blows given on the solid mass of a train under the double buffer system.

I have not heard what system of brake is contemplated for the new stock, but most earnestly hope that the chain brake—proved to be so very effective and simple of adaptation on the Main Line—will be adopted, in order that the new vehicles when altered as provided for by the Engineer-in-Chief may be completely interchangeable with Main Line stock. It is certainly extremely essential that a uniform system of braking trains should be adopted, and the chain brake, in the existing, or modified form as adopted on the London and North-Western Railway of England, seems to be the best at present designed for mixed trains.

Apologising for troubling you with this long communication, which only the great importance of the subject to the public convenience can warrant,

I have the honor to be,

Sir,

Your most obedient Servant,

C. H. GRANT.

The Hon. W. R. GIBLIN, Premier and Attorney-General.

FORWARDED to the Hon. Minister of Lands for perusal and consideration.

W. R. GIBLIN.
13. 10. 83.

REFERRED to the Engineer-in-Chief for his remarks.

NICHOLAS J. BROWN.
18. 10. 83.

Public Works Office, Hobart, 27th October, 1883.

SIR,

As instructed in your Memo. upon Mr. Grant's letter of the 12th instant, I proceed to make a few remarks on the matters referred to in that letter.

In the first place, Mr. Grant assumes that the Government "surrendered" the very important question of the interchangeability of rolling stock between the new Government lines and the Main Line when deciding upon ordering the necessary stock for the Launceston and Western extension to Formby; but such was not the case, as you are aware. The necessity for preparing for interchange of stock was as fully recognised by your officers when advising the description of stock to be obtained as it is by Mr. Grant; in addition to which I would ask you to bear in mind that your officers will have the responsibility of working this stock and adapting it to the public requirements, including the forwarding of "through" traffic from time to time. Realising this responsibility, much trouble has been taken to make all the arrangements as complete as possible.

It is most certainly not acknowledged that the advantage proposed to be gained is "purely imaginary," or that delay will occur in fixing the "coupling buffers" to the stock when being forwarded to points upon the Main Line, or *vice versa*. Only two of these coupling buffers will necessarily be fixed on each train, and this operation will be as simple as the attaching and coupling-up of an ordinary screw coupling,—a work that has to be done on every train. Trucks or carriages will be ready for meeting trains, and no such detention as Mr. Grant supposes need ever take place.

It is impossible to understand what Mr. Grant means when he says that no provision is made for running the rolling stock of the Main Line over the Western Line.

It is evident that the affixing of the "coupling buffers" already explained will at once enable the Main Line stock to pass upon the Western Line in precisely the same manner as stock going the opposite way; consequently, Mr. Grant's "horrors" of break of gauge are altogether imaginary, and it is difficult to understand how he could have misunderstood this very simple matter, unless it be that he has written hurriedly and without sufficient knowledge of the recommendations of the advisers of the Government.

There will be no necessity whatever for transfer sidings, transfer platforms, or for a supply of extra stock at the Evandale Junction. All the anticipations of "delays" and "interference of freighting arrangements" are therefore simply the result of a strange misconception on Mr. Grant's part.

In making my recommendations to the Government I had the advantage of consulting with the officers of the Launceston and Western Railway, Messrs. Lord and Batchelor, the latter of whom has had most extensive experience in the working and manufacture of rolling stock of every description, both for broad and narrow gauge railways, during the past 25 years. From the information I received, and after carefully considering the matter myself, I was convinced of the great advantages that would be obtained by the adoption of "corner" or "double buffers," and therefore recommended the design, with a simple "buffer coupling" arrangement to secure perfect interchangeability. The haulage strain will not be at the two sides or corner buffers of the new stock, as might be supposed by persons unacquainted with railway matters, but will be on the centre of the Government vehicles, as on those of the Main Line.

I can readily understand how any person knowing the class of rolling stock that has been ordered for the Formby extension would imagine that an unfavourable comparison would be made with the bulk of the Main Line rolling stock, particularly with the original four-wheeled carriages, which, when imported, were supplied with spiral springs,—a design even at that time obsolete.

Mr. Grant makes a quotation from a Memorandum of Mr. R. W. Lord's upon the importance of uniformity of gauge, and seems to confound this with uniformity of buffers. This is entirely misleading; for whilst no one could fail to recognise the importance of the former, the difficulties with the latter are, as I before remarked, purely imaginary.

I have no doubt that the Manager of the Launceston and Western Railway quite appreciates the advantage that would accrue in working his traffic on busy holidays by borrowing trains of carriages from the Main Line Company, and that he would be always ready to reciprocate this privilege.

Mr. Grant appears to suggest that this would become an impossibility through the adoption of double buffers; but surely he can see no difficulty here; as, if necessary, the trains could be marshalled quite independently, and, as the gauge will be uniform, the fullest advantage can be taken of this most important item in meeting the public convenience. Quite irrespective of this, however, the "buffer coupling" will completely do away with any complications whatever.

As there are no statistics available to show the relative proportions of rolling stock in the world fitted with "central buffers" and "double buffers," Mr. Grant's statement is a mere opinion, with which I cannot agree. I can state positively that in Great Britain and upon the Continent of Europe, and throughout the standard gauge lines in India, double buffers are used. I think also that Mr. Grant is again wrong in stating that American designs of rolling stock are gradually replacing all others. This can only be an assumption, and, for my part, I do not think it is by any means the case.

I have always understood the New Zealand stock to be the most inferior in the Colonies, with the single exception of the original four-wheel stock of the Main Line previously referred to. On the other hand, I believe the Queensland narrow-gauge rolling stock to be the type best suited to this Colony. The Queensland Government made the first 3 feet 6 inch line of railway in these Colonies, and their consulting engineer, Sir Charles Fox, was instructed to procure the very best description of rolling stock from time to time. They tried single and double buffers, and eventually universally adopted the latter. They also tried one loose wheel on an axle, both wheels loose, loose tires, flexible wheel bases, bogie stock,—Fay's, Clark's, Adams', Grover's, and Clemenson's systems, and also Fairlie's engines; and after a thorough trial of all, have adopted a design similar to that ordered for the Mersey Extension.

Mr. Grant remarks that he is informed that all the stock ordered has a long wheel base. This is a mistake. It is only the carriages that are long, and upon double bogies; all the rest is short four-wheeled stock.

Upon a new line running through sparsely populated districts, with small traffic, it would be a great mistake to use long stock carrying large loads. I should certainly never recommend long stock on 6 wheels, or double bogies, carrying loads of some 16 tons, for Tasmanian railways, inasmuch as it would seldom be possible to secure a full load.

South Australia is referred to as possessing excellent narrow-gauge rolling stock, and adopting the central buffer. This is quite correct; but all their stock is long stock on 6 wheels, or on double bogies, with which the question of buffers is of less pressing importance. Moreover their traffic is a large one, justifying the use of such a class of vehicle. The central buffer in use in South Australia is, however, a very different one to that in use upon the Main Line, and much superior in every way.

Mr. Grant is singularly unfortunate in referring to the "new stock only just received from the best builders in England for the Van Diemen's Land Company."

As a matter of fact, the carriages so supplied have been sent out with a rigid wheel base of no less than 20 feet; and I am informed that the engineer who is responsible for this most fatal mistake acts for the Main Line. These carriages are quite useless in their present state, and could not traverse any curve.

Whilst commenting upon the description of rolling stock imported by the Main Line Company for their traffic, it would seem to be only fair here to remind you of some further errors committed in connection with this stock.

It was found that the engines first imported to work the traffic of the Main Line, and which were specially designed for it, would not run at all, and could not keep the line even round a curve of one mile radius. Mr. Batchelor was specially requested to report upon them with a view to suggesting an alteration of the design so as to adapt the engines to the requirements of the Main Line; he did so, and his suggestions were carried out with complete success.

I cannot agree with Mr. Grant, that in rolling stock, with a short wheel base, there is more rigidity with double buffers than with central buffers. I cannot, either, understand how he can speak of a train, furnished with compressible spring buffers, being, when coupled up, like a "string of connected solid blocks."

Mr. Grant must assume that the buffers have no flexibility, and that they are composed merely of "solid iron castings;" this must arise from the absence of reliable information as to the Government stock.

With reference to brakes, the chain brake of Messrs. Clark and Webb has been ordered by the Government.

I most earnestly trust that no alteration whatever will be made in the order for rolling stock now being executed, as I have every confidence in its giving satisfaction. The occasional excessive oscillation of the vehicles, which must have been remarked by all travelling on the Main Line, frequently causing giddiness and sickness to ladies and delicate persons, will be prevented by the use of "double spring buffers," and a general steadiness of running will be secured throughout the whole train.

I enclose copies of the opinions of Messrs. Jetter, Meilbek, and Horniblow upon the subject dealt with in this letter.

I have, &c.

JAMES FINCHAM, *Engineer-in-Chief.*

The Hon. the Minister of Lands and Works.

EXTRACT from Letter dated February 13th, 1879, from Mr. J. F. L. JETTER addressed to Mr. W. E. BATCHELOR.

"I SHOULD recommend you to adopt side buffers and a screw coupling in centre like the Queensland stock, except that I would have wrought iron buffer cases and the buffers on Turton's patent made elastic, so as to give on the curves. The through buffer-rods and long transverse spring are expensive.

"I think, considering the heavy gradients and curves of the Main Line, this would make the safest coupling, and I would add safety chains."

EXTRACT from Letter dated January 12th, 1883, from Mr. MEILBEK addressed to Mr. W. E. BATCHELOR.

"I am glad you have decided for side buffers, and Turton's are the best made. I would not recommend central buffers for the narrow gauge, say 3' 6" (which I presume the Mersey Extension is to be), for various reasons,—viz., the head is, as a rule, so cut up that it is only half a buffer; the slack cannot be taken up as with a screw coupling (except in Turton's, of which I enclose a drawing); and the arrangement is, as a rule, too complicated for ordinary working; moreover, in running round sharp curves with long vehicles severe transverse strains are brought upon the buffer-rods. This, I think, is our experience in South Australia."

EXTRACTS from Letter from MR. J. MEILBEK, Engineer, Westminster, dated October 5th, 1883, addressed to R. W. LORD, Esq.

"THE adoption of the side buffers on the Mersey Line is a very wise and practical course. There is not a satisfactory central buffer in existence; not even those which are arranged to take up the slack. They leave the vehicle to roll on the line at pleasure, and are only a source of trouble. As for the Main Line buffer, well, when I got a tracing of it from the Bristol Wagon Co. I would not work to it to design our special central buffer (for coupling the Mersey with the Main Line stock), thinking it must be a mistake, and probably it is a discarded design now. I wrote this to Mr. Batchelor last mail, but since then his tracing of the same buffer came to hand. I do not know how such a primitive thing can be used on any line. Unless a central buffer can be made self-coupling there is nothing to recommend it, except that it is safer for the men."

[TELEGRAM.]

Ipswich, 25th October, 5 P.M.

CENTRAL buffers not suitable for four-wheeled stock on narrow gauge where sharp curves abound, because wheel base must be short. Oscillation cannot be prevented on straight road at high speed without side buffers and screw coupling. Strongly recommend your Government to adopt side buffers.

H. HORNIBLOW, *Loco. Engineer, Ipswich.*

To W. E. BATCHELOR, Loco. Supt., Launceston.

[TELEGRAM.]

Jerusalem, 25th April, 1884.

NOTICING from the leader in this morning's *Mercury* that the Government have received official Reports on the subject of central or side buffers for their new rolling stock, may I beg the favour of being allowed to peruse them? The matter is of infinite importance to the Railway system of the Colony, and it is quite impossible that it can receive too much consideration.

C. H. GRANT.

Hon. W. R. GIBLIN, Hobart.

Attorney-General's Office, Hobart, 26th April, 1884.

DEAR SIR,

ON receipt of your telegram yesterday I communicated with the Hon. Minister of Lands, who has forwarded me press copies of certain communications as to the buffer question, but nothing that is new. With the Minister's concurrence, I forward them for your perusal rather than delay in making copies.

Please return when perused.

Yours faithfully,

W. R. GIBLIN.

C. H. GRANT, *Esq.*

Extract from letter dated 12th January, 1883, from Mr. Meilbek, addressed to Mr. W. E. Batchelor.

Ditto, 13th February, 1879, J. F. L. Jetter to same; Telegram, 25th October, 1883,

H. Horniblow to W. E. Batchelor.

Letter 27th October, 1883, J. Fincham to Hon. Minister of Lands.

Hobart, 28th April, 1884.

DEAR SIR,

I feel extremely obliged for your kind courtesy in acceding to my request for information (although very informally made) as to the reports made by the Government advisers on new rolling stock for the proposed branch railways, and return herewith the copies of letters, &c. from Messrs. Meilbek, Jetter, and Horniblow, and Report of the Engineer-in-Chief.

But for the extreme importance to the system of intercommunication through the Colony of complete interchangeability of the whole rolling stock, I would not have presumed to trouble you on the matter. I feel so very strongly that a great mistake is being made, which will lead to disastrous consequences, and therefore will venture to trouble you again in reply to Mr. Fincham's statements. He views the matter from an engineer's standpoint only: I feel obliged to give more consideration to the practical effect as known to the railway manager.

Yours faithfully,

C. H. GRANT.

Hon. W. R. GIBLIN, M.H.A., Premier.

*Tasmanian Main Line Railway Company, Limited,
General Manager's Office, Hobart, 6th May, 1884.*

SIR,

In a communication I had the honor to address you on the 12th October last, I felt it only due to the Government that I should place before them my opinion (as a practical railway engineer of nearly 35 years' experience, particularly interested in railway rolling stock of every description from the very commencement of that time, and not wholly unacquainted with railway management) on the effect that the alteration, proposed by the advisers of the Government, of the couplings of stock used on this Railway in preparing that for the Mersey and Deloraine and new lines would have upon the daily working of the traffic.

Through your kind courtesy I have been enabled to peruse the remarks of the Engineer-in-Chief upon my statements, and note that he adheres to his theoretical considerations, which is naturally to be expected from his not having had the daily opportunity of perceiving the enormous importance of some little matters of which he now thinks lightly.

In criticising the proposed new stock I acknowledge the disadvantage of being entirely ignorant as to its design; and as a Tasmanian colonist, with a very large stake in its prosperity, I cannot but express regret that some little consideration was not shown to the practical experience of those engaged in working the Main Line, to which all lines hereafter constructed must necessarily be to a great extent subsidiary. It has hitherto been the invariable rule that the owners of lines should be consulted before any foreign stock is allowed to run thereon; and I submit that, in the particular circumstances of this Colony, it would not have been injudicious that the knowledge we have obtained by working the Main Line, under adverse circumstances, during the past eight years, should have been to some extent utilised, or, at any rate, made known to those who design the stock which must necessarily traverse it. I am well aware that it was formerly the custom for engineers to prepare rolling stock for new lines without consulting the views of railway managers; but such a practice led to the most serious evils and enormous waste of money. Consequently at the present time the managers of all important railways are called upon to specify their requirements, and the type of stock they prefer, before the engineers commence its construction.

I cannot, in the absence of information that the Government propose to take the Main Line, agree with Mr. Fincham that he "will have the responsibility of working this stock, and of adapting it to the public requirements, including the forwarding of through traffic from time to time;" since when the engineer has placed the stock on the line he has done with it, and the troubles of the manager commence.

I differ as to his view "that no delay will occur in fixing the coupling buffers to the stock when forwarded to points upon the Main Line Railway, as only two of these coupling buffers will necessarily be fixed on each train," by which I understand him to assume that a train of trucks to be forwarded, say from Evandale Junction to Main Line Stations, would be connected together there, and only require attachment at each end. This would be all very well were the whole of such trucks intended for, say, Hobart; but in practice this would never be the case. More than half of them would be for Corners, Campbell Town, Oatlands, and other stations, possibly Evandale, only two miles distant. The train, therefore, directly after it had started would have to be disjointed by putting off these trucks, and with each truck it would be necessary to leave a coupling buffer, or it could not be properly re-attached. The worst fault, however, is that in consequence of the want of uniformity double shunts would have to be made at each station where there were trucks of the different systems to be left, and the loss of time due to this would be fatal to the possibility of running to the time table as now arranged, or likely to be.

I see no means of obviating this difficulty except by the permanent fixing of the coupling buffers to each of the new trucks, so that they should not get astray; but even then the loss of time caused by the dual system would be fatal to good management.

It was on these considerations I mentioned the want of provision for running the rolling stock of the Main Line Railway over the Western Line, for all the same difficulties would there obtain. Although I have no knowledge of the construction of such coupling buffer as a practical manager, I can see no possible manner in which it can be utilised without causing great loss of time and making really the "break of gauge," which not only myself, but every one interested in the matter, must view with aversion.

The alternative proposal of transfer sidings and platforms would, I think, be the only way of meeting the evil, and Mr. Fincham's reply does not alter this view. I wholly fail to perceive how his plan of marshalling trains of the different systems quite independently in a station-yard crowded with stock, with very little room to move it in, could be practically carried out. In any case it would necessitate an enormous increase in the siding accommodation and in the time necessary

for marshalling trains, and therefore in the working expenses. To my mind it would be a practical impossibility; and here again I would prefer (taking a station-master's responsibility) that the stock should be treated as of a different gauge and kept in entirely different yards and sidings, rather than be intermingled, to the utter confusion of the arrangements.

That Mr. Fincham should, from an engineering point of view, recommend double buffers instead of single buffers I can readily understand, and as a professional man he would, under ordinary circumstances, be undoubtedly right in using the mechanical means he considers best adapted for the object in view. I do not wish to contest his well-considered opinion on the mechanical arrangement and general design of the stock; but in a matter which affects the undertaking I am connected with to such a very serious extent I feel that no offence should be taken that I state difficulties which I feel will occur and be a source of infinite trouble and vexation to every one concerned in the railway system of the Colony, and in no less degree to its whole population, who are directly interested in the railway facilities obtainable.

Mr. Fincham's depreciatory remarks as to the rolling stock of the Main Line Railway originally sent out exhibit the strong prejudice he formed against it from the very first, which a subsequent practical experience of it would, I believe, have modified, but do not affect the question between us. A want of consideration of the contract speed and desire for economy induced the designer of the stock (Mr. Cleminson, who has probably a higher repute than any living authority in such matters) to use a form of springs which was unsuitable, though certainly not "obsolete," being of newer design than the usual spring, to which we have returned.

I am aware of all the circumstances Mr. Fincham details in regard to the Queensland rolling stock, which have resulted in that Colony having the most hybrid and unsatisfactory stock of any in these Colonies, and now, I believe, long bogie stock only is being constructed there, thus differing from the short four-wheeled stock ordered for the Mersey Line. It is only in the passenger stock that the buffer is of any importance, so there would appear to be a little inconsistency in the admission that the central buffer answers in South Australia on account of being applied to long carriages, but would not do so on the long and similar carriages now said to be designed for this Colony. I do not argue that Mr. Fincham should adopt the Main Line buffer, or even a similar design, in any way whatever, but only that he should adopt such a design of coupling that the two classes of rolling stock would be practically and completely interchangeable. A competent authority, who has been informed as to the detail of the "loose sleeve central buffer" designed to unite the different vehicles, advises me that "no practical man can imagine this kind of thing will ever work satisfactorily."

Mr. Fincham will, I feel sure, be glad to learn that his remarks of a mistake being made in the design of the carriages for the Van Diemen's Land Company's line have proved entirely groundless, for they appear to be peculiarly successful in every respect. The high English authority who designed such stock informs me of a modern description of long non-bogie under-carriage that is superseding all others on the very best English lines, and of which I am now obtaining the particulars.

I am free to admit that, from an unexplained cause, the large engines sent out for the Main Line would not run, although apparently similar engines are most successfully used elsewhere. The necessary alterations were quite obvious, and Mr. Batchelor concurred in what the contractors had decided to effect.

The other criticisms of my statements refer to merely comparative matters, and not to statements of absolute results. I shall be indeed glad to find that the oscillation of the Main Line carriages can be cured by the adoption of double buffers, provided this undoubted advantage can be obtained without greatly increased risk and wear on the curved portions of the line. The cause of sickness, which occurs mostly on the Southern end of the line, cannot, I fear, be prevented, or even reduced, by any contrivance of buffer, being caused by the high speed at which reverse curves have to be passed over.

I sincerely trust that the remarks above made will be graciously received, and wish to disclaim all intention of being merely controversial, or as having any other object in writing but a simple feeling of loyalty to the best interests of the railway system of the Colony.

I have, &c.

C. H. GRANT.

*The Hon. W. R. GIBLIN, M.H.A.,
Premier and Attorney-General.*

FORWARDED to the Hon. Minister of Lands for his perusal and consideration. The receipt of the letter has been acknowledged, but the matter involves discussion of technical details which I think must be left to experts.

W. R. GIBLIN.
7. 5. 84.

REFERRED to the Engineer-in-Chief for his remarks.

NICHOLAS J. BROWN.
13. 5. 84.

Public Works Office, Hobart, 3rd June, 1884.

SIR,

I HAVE the honor to acknowledge a letter dated 6th May, 1884, from the General Manager of the Main Line Railway, forwarded by you for my remarks, under date 13th May, 1884, and in reference to the question of buffers to be used in the new Government rolling stock.

I note that Mr. Grant can readily understand that, from an engineering point of view, the double buffers (proposed for the Government stock) should be recommended instead of single buffers (as on Main Line Railway), and that he thus admits the superior design of the double buffers.

Should Mr. Grant's worst anticipations be realised, I admit that one set of stock might require some alterations in order to work harmoniously with the other. Seeing, however, that the double buffer system is admitted to be the best mechanical arrangement; seeing also that the number of vehicles for the Government lines for which orders are already placed exceeds the number of vehicles belonging to the Main Line Company, and that in view of probable early further extensions of Government railways this excess will be still more marked, I would submit that, instead of the Government system being necessarily, to a great extent, "subsidiary to that of the Main Line Company," the reverse will be the case; and that the smaller number of vehicles of the Main Line Company should be altered, if necessary, instead of the larger number that will belong to the Government.

I have no doubt that, with a desire on the part of the officers of the Government and Main Line Railways to work harmoniously together, the proposed central coupling buffer will answer all practical requirements, and save the Main Line Company the trouble of alterations which it would otherwise be necessary to make.

I have, &c.

JAMES FINCHAM, *Engineer-in-Chief.*

The Hon. the Minister of Lands and Works.

Lands and Works Office, Hobart, 5th June, 1884.

SIR,

I HAVE the honor to inform you that your letter of the 6th ultimo, on the subject of the adoption of double buffers for the rolling stock now being manufactured for the Tasmanian Government railways, which was addressed to the Hon. the Premier, was forwarded by the Premier to me. As the questions dealt with in your letter are such as can only be decided by experts, I referred your letters to the Engineer-in-Chief for his remarks, and have, in reply, received from him a communication, a copy of which I enclose.

I trust that the harmonious co-operation spoken of by the Engineer-in-Chief as necessary to ensure the satisfactory working of interchangeable stock, will prevent any such practical inconvenience arising as that which you appear to apprehend.

I have, &c.

NICHOLAS J. BROWN, *Minister of Lands and Works.*

C. H. GRANT, *Esq.,*

Manager Tasmanian Main Line Railway Company.

*Tasmanian Main Line Railway Company, Limited,
General Manager's Office, Hobart, 12th June, 1884.*

SIR,

I HAVE the honor to acknowledge the due receipt of your letter dated the 5th instant, and of the enclosure of a copy of a letter addressed to you by the Engineer-in-Chief bearing date the 3rd instant.

It is scarcely necessary that I should assure you of the earnest desire of the Main Line Railway Company to very cordially co-operate with the Government in the working of the railway system of

this Colony in every detail; and I would not have thought it necessary to trouble you further on the question of double or single buffers for rolling stock, had not the Engineer-in-Chief somewhat misunderstood my remark that I could readily understand that from an engineering point of view he would recommend double buffers, and that I thus admit the superior design of double buffers; but I submit that the whole context of my letter disproves this view: I simply remarked that reasoning only on theory might lead to the conviction that the almost universal adoption of single buffers for narrow gauge railways in all parts of the world had been incorrectly arrived at, and erroneously continued to this day. I, however, suggest that general practical experience will be proved the best guide, and look forward with much apprehension to the passage of vehicles with double buffers round sharp reverse curves at high rates of speed. For this reason I would strongly urge that samples of the proposed rolling stock be forthwith made in this Colony, and practically tested on the Main Line before the whole is placed under construction.

Mr. Fincham is also under a misapprehension as to the relative proportions of the rolling stock in use on the Main Line Railway and that to be provided for all the other new railways authorised by Parliament, when he observes that—"seeing the number of vehicles for the Government lines for which orders are already placed exceeds the number of vehicles belonging to the Main Line Company, the smaller number of vehicles of the Main Line Company should be altered if necessary, instead of the larger number that will belong to the Government"—since the total number of vehicles ordered or proposed to be ordered for the whole of the new railways, including the Launceston and Western and the Mersey Extension, as stated in an official communication to the press, amounts to 298 only whereas the present equipment of the Main Line Railway is 316 vehicles. These, I regret to state, are totally inadequate to the proper and economical conduct of the existing traffic, and are therefore being supplemented by the manufacture of each class of stock in the Company's workshops. The cost of altering the Main Line Company's stock would therefore be far more serious than is supposed, while to do this would be an innovation on well established practice that has hitherto given a satisfactory result.

I have, &c.

Hon. N. J. BROWN, *M.H.A., Minister of Lands and Works.*

C. H. GRANT.

Public Works Office, Hobart, 21st June, 1884.

SIR,

I HAVE the honor to acknowledge yours of the 12th instant, in reply to my letter dated 5th instant, and think that the whole question had now better be left to a practical test, and to that cordial co-operation on the part of the Main Line Railway Company of which you have kindly given assurance.

I attach Memo. from the Engineer-in-Chief bearing upon your query as to number of vehicles, &c.

I have, &c.

C. H. GRANT, *Esq., Manager T.M.L.R., Hobart.*

NICHOLAS J. BROWN,
Minister of Lands and Works.

Public Works Office, Hobart, 20th June, 1884.

MEMO.

Government Narrow Gauge Rolling Stock.

THE stock would be connected with draw-bars and hooks in centre; the carriage buffers will have a travel of twelve inches, the wagon buffers a travel of four inches, which will be amply sufficient for the train while passing round the sharpest curves.

The stock ordered for the Mersey Line will be in the Colony long before it will be possible to make any here, even supposing that wheels, axles, &c. were obtainable. Ample opportunities can then be afforded for any tests required.

The exact number of vehicles of all kinds in use on the Main Line Railway on the 14th day of May, 1884, was 286, according to the inventory taken by the Government Officers on that date, and four cattle trucks were then under construction in the workshops.

It is fair to assume that increases in the requirements for rolling stock will take place also on the Government lines, and in the comparison which I made I abstained from all reference to the early conversion of the Launceston and Western stock to the narrow gauge.

I cannot think that the Main Line stock possesses all the advantages that Mr. Grant naturally claims for it. My recent inspection of the permanent way revealed (as on former occasions) many places where a truck or carriage has left the rails.

JAMES FINCHAM, *Engineer-in-Chief.*

The Hon. the Minister of Lands and Works.

*Tasmanian Main Line Railway Company, Limited,
General Manager's Office, Hobart, 24th June, 1884.*

SIR,

I HAVE the honor to acknowledge the receipt this morning of your letter dated the 21st instant, with which you enclose the copy of a Memo. addressed to you by the Engineer-in-Chief, respecting the rolling stock to be used on the new lines that are now in course of construction in this Colony. On this I have only to observe that should Mr. Fincham approve of having any carriages or wagons made for trial purposes on the exact plans he has authorised the use of, we have spare wheels and axles, and all the material ready for manufacturing them in a very short time, and I will guarantee that the quality thereof shall be at least equal to any of the imported rolling stock. The Engineer-in-Chief is nearly correct as to the number of vehicles on the Main Line Railway at the end of last year, which was 287 then running, the error as to one truck having, I believe, been made in this office, but more carriages and wagons were then in course of construction than would be implied from his remark. The number of vehicles I quoted is that of those now actually running on this railway.

My chief apprehension as to the satisfactory working of the double buffer rolling-stock is that it will not keep to the rails in passing round curves so well as the more free running vehicles now used by the Main Line Railway Company, but I shall be indeed pleased to find from practical experience that my objections in this respect at least are groundless.

I have, &c.

C. H. GRANT.

Hon. N. J. BROWN, M.H.A., Minister of Lands and Works.

REFERRED to the Engineer-in-Chief for his remarks.

NICHOLAS J. BROWN.
26. 6. 84.

I HAVE nothing to add to my former remarks.

The Hon. the Minister.

J. FINCHAM, *Engineer-in-Chief.*
27. 6. 84.

Public Works Office, Hobart, 27th June, 1884.

SIR,

I BEG to acknowledge the receipt of your letter of the 24th instant, with reference to rolling stock for new lines now in course of construction, which will receive early attention.

I am, &c.

NICHOLAS J. BROWN,
Minister of Lands and Works.

C. H. GRANT, *Esq., Manager T.M.L.R., Hobart.*

*7, Westminster Chambers, Victoria-street, London, S.W.,
23rd May, 1884.*

SIR,

HAVING heard from Mr. Lord how much interested you were in the question of side *versus* central buffers, and the controversy which arose in the Colony in consequence of the adoption of side buffers for the rolling stock of the new Government lines, I take the liberty of addressing you personally, and laying before you a few observations upon the merits and defects of the two systems.

The principal advantages claimed for the central buffer system by its advocates are—that it is cheaper than the side buffer system; that the buffers act as both buffing and draw gear at the same time; that they are self coupling (*if of the correct design*); and that they are freely accessible for uncoupling without endangering life.

On the other hand, it is pointed out that the side buffer system is too expensive, and unnecessary for narrow gauge lines; that the coupling up of vehicles cannot be done automatically; and that both coupling and uncoupling is always a dangerous performance.

With regard to the cheapness of the central buffer gear, it is probably true that ordinary buffers with a simple link and pin, same as used on the Tasmanian Main Line, are cheaper than 4 side buffers with 2 screw couplings; but in virtue of this very cheapness all the other supposed advantages of the central system are eliminated from this class of buffer, with the exception of accessibility. Taking, however, a complete Norwegian buffer, with hook, shackle, pins, &c. (as used on the South Australian lines), which is self-coupling, I have reason to think that with all the necessary details the two buffers will be very nearly as expensive as 2 screw couplings and 4 side buffers.

The action of the central buffer system, as both draw and buffing gear, involves considerable complications in the details, which impair the efficiency of both actions.

Most narrow gauge lines are constructed with very sharp curves, and the vehicles often vary considerably in length (as will be the case in the new Government stock); and when long carriages and short wagons are coupled together in one train, the central buffers in running round curves would assume the position indicated in sketch A, resulting in a severe bending moment being brought on one of the buffers. To avoid this the hole in draw-plate is often elongated so as to allow both buffers to be as near as possible in a straight line; but directly this is done the buffer has been deprived of its guide in the head stock, and will move horizontally in buffing, having again to withstand considerable bending moments. This work has to be resisted only by the narrow shank of the buffer. If buffing on a curve this defect is much intensified. The side buffers, no doubt, have to overcome the same difficulty on curves, but they are stiff, have a large base and a long guide.

The advantage of "*self-coupling*" in central buffers applies only to certain designs of these buffers, such as the South Australian or Norwegian, the Zanne coupler and buffer, Turton's central buffer, Ibbotson's, and others, all, however, of a much more complicated design than, for instance, the Main Line buffer, which is not self-coupling.

It appears to me that the advantage of self-coupling is rather over estimated, and can only be obtained by complication of details, which render the buffer less effective in other respects. In the South Australian, Turton's, and Ibbotson's, for instance, the best portion of the buffer-head has to be cut away to make room for the self-coupling details, and instead of a complete buffer there remains actually only half a buffer.

The accessibility of central buffers in coupling and uncoupling is, I consider, the only real advantage of central buffers, which cannot be disputed; but its absence with side buffers cannot surely be considered a serious defect if it is borne in mind that in this country where side buffers are the exclusive rule, accidents through coupling and uncoupling are of rare occurrence.

One of the principal defects of the central buffer system is, that the whole force of the buffing is concentrated on one point of the underframe, and that the weakest point, viz., the centre of the headstock, which has, therefore, to be stiffened to take up the force, and thus increased in weight. With side buffers the force of buffing is divided and applied at two points situated as near as possible to the sole bars, where the underframe has the greatest strength and stiffness.

In several of the patents of central buffers provisions are made for taking up the slack between vehicles, either by means of a special screw coupling or by eccentrics, but this adds only to the already numerous complications.

As a means for steadying vehicles against oscillation on an uneven road or against jerks in passing over points and crossings, the central buffer is entirely useless; the vehicles merely rock round it as upon a spindle, and are allowed to follow freely all the inequalities of the road, without in the least mitigating the sudden jerks and jars: hence the rough and jerky riding always experienced in carriages fitted with central buffers. The side buffers, together with screw couplings, counteract these tendencies, and increase the steadiness of carriages on an uneven road.

The assumption that a single buffer is quite sufficient for the requirements of a narrow gauge stock is, in my opinion, fallacious. It could only be supported if the width of vehicles were less in proportion to the gauge; but as the stock of narrow gauge lines is mostly the same width as on broad gauge lines, it is evident that the force producing oscillation will be greater on narrow gauge lines in proportion as the inverse ratio of the width of gauge, and side buffers for narrow gauge stock are therefore more necessary than for broad gauge stock.

The question now arises, have the officers of your Railway Department done wisely in adopting the side buffer system? I would answer this question decidedly in the affirmative, and in support of it would only advance the following argument, viz.: had even your Railway Department decided for the central system, could they have conscientiously adopted the central buffer of the Tasmanian Main Line, remarkable only for its primitive simplicity? In view of the numerous improved modern designs, they could not have done so without detriment to the efficiency of the new stock, and would have had therefore to adopt a central buffer really possessing all the merits claimed for the

system,—a course which would have been worse in its results than the present arrangement, because the vehicles of the new lines would not have, in all probability, coupled up with the Main Line stock at all, whereas by means of the special central buffer, to be provided at junctions, it will be possible to couple up the vehicles within the space of a quarter of a minute.

I would finally observe that, in my opinion, any system of draw and buffing gear, to be perfect, ought to consist either of two side buffers and a screw coupling, or one central buffer exactly the same as an ordinary side buffer, and two screw couplings with hooks and springs, one on each side of buffer, and seeing that it would be difficult to give, in the latter case, to both the couplings the same tightness, I should prefer the former arrangement.

Trusting that by this somewhat lengthy letter I have not trespassed too much upon your valuable time,

I am, &c.

The Hon. NICHOLAS J. BROWN,
Minister of Lands and Works, Hobart, Tasmania.

J. MEILBEK.

P.S.—I have pleasure in enclosing woodcuts and descriptions of Zanney's, Turton's, and Ibbotson's buffers, probably the most perfect of central buffers. Z. M.

FORWARDED to the Engineer-in-Chief.

NICHOLAS J. BROWN.
3. 7. 84.

FORWARDED to the Manager Launceston and Western Railway for perusal, and early return.

J. FINCHAM, *Engineer-in-Chief*.
4. 7. 84.

RETURNED to Engineer-in-Chief after perusal by Mr. Batchelor and myself. R. W. LORD.
7. 7. 84.

Tasmanian Main Line Railway Company, Limited,
General Manager's Office, Hobart, 23rd July, 1884.

SIR,

IT would not have appeared necessary that I should acknowledge the receipt of your letter of the 27th ultimo, or continue our correspondence on the subject of the draw and buffing arrangement it is proposed to use on the new Government Railways rolling stock, notwithstanding the publication in the daily press of Mr. Meilbek's letter addressed to you and dated the 23rd May, had not the correspondence been asked for in Parliament.

On your kindly expressing the desire that I should see the model of the arrangement proposed by Mr. Batchelor for connecting the two systems of central and double buffers, I had the honor to personally point out to you the serious difficulties these would entail, and verbally corrected the errors made by Mr. Meilbek which had the same morning been made public; but as the discussion would not be complete without these are stated, I venture to trouble you with the briefest explanation I am able to make.

Mr. Meilbek, in stating some of the advantages of the central over the side-buffer system contends that the first is comparatively valueless unless the coupling be made automatic, and then gives his opinion that the advantage of self-coupling is rather over estimated, and can only be obtained by a complication of details which render the buffer less effective in other respects, for which reason the new Government stock is not, I believe, to be made with automatic couplings.

I concur in the decision, not for the reason alleged, but as a matter of necessity. We have tried on a large scale the automatic couplings with an eccentric for taking up the slack between vehicles, and similar couplings, tightened by a special screw, are now in use on the new rolling stock of the Van Diemen's Land Railway.

With us it was impossible to work even the best designs of this system, because the vehicles could not be coupled at all on the curved sidings with which the yards of the termini are necessarily laid out, and the Manager of the Van Diemen's Land Railway finding the same difficulty informed me of the probability that he would abandon the use of automatic couplings in favour of the simple link and pin found to work so satisfactorily on the Main Line.

Mr. Meilbek admits the great importance of the accessibility of central buffers for coupling and uncoupling, but considers that as the system of double buffers prevails in England this difficulty cannot be a serious defect. He forgets, however, that the height of the buffers on the comparatively broad gauge of English lines admits of the porters stooping beneath them, but this will be found most difficult and dangerous on the much lower buffers of the narrow gauge, and will necessarily lead to much delay in marshalling trains.

Mr. Meilbek then urges, as the principal defect of the central buffer system, that the whole force of buffing is concentrated on one point of the under-frame, and that the weakest point,—viz., the centre of the head stock,—which has therefore to be stiffened to take up the force, and thus increased in weight. He then, as in a previous communication, remarks on the “primitive simplicity” of the Main Line buffer, which he would object to the adoption of. On comparing these statements with my previous letters, it will be seen that Mr. Meilbek has judged the Main Line arrangement without having the smallest knowledge thereof.

He assumes that our best passenger stock, which in all essential points is as good as any ever made, is only provided with the simple arrangement used for contractors’ wagons. Such is very far from being the case. The Main Line draw-bar and buffer is continuous throughout the train, and is independent of the head-stocks and sole-bars on which the other system has to rely. It is virtually an elastic chain stretching throughout the train to which the carriages are attached, and thus the great extra weight and stiffening so essentially necessary in the double-buffer system is entirely avoided.

The objection that on the Main Line the carriages run to a great extent independent of each other refers to what has been proved a necessity, not only on this, but on other curved lines where it has been attempted to tighten the carriages together. On the newly constructed lines in Victoria, in which curves have been introduced for economical reasons, it has been found necessary to abandon the system of tight coupling with the long carriages, which are now prohibited from being coupled tight where they traverse curves of 800 feet radius,—those of the Main Line being 330 feet.

Mr. Meilbek’s objection that round a central buffer the vehicles merely rock round it as upon a spindle, is met by the remark of the most practical locomotive authority in Australia, that it affords the desirable “knuckle-joint.” It may further be observed, that in the Victorian stock the side buffers are connected by a special equilibrium beam, and complicated series of springs made expressly to allow of tightly coupled stock running properly round curves; but even this will not allow of any strain being used.

Having shown that Mr. Meilbek bases his arguments on utterly erroneous grounds, you will doubtless be well satisfied that I do not trouble you with their refutation.

I have, &c.

C. H. GRANT.

Hon. N. J. BROWN, M.H.A.,
Minister of Lands and Works.

REFERRED to the Engineer-in-Chief for his remarks.

NICHOLAS J. BROWN.
24. 7. 84.

Lands and Works Office, Hobart, 29th July, 1884.

SIR,

I HAVE the honor to acknowledge the receipt of your letter of the 23rd instant, offering some further remarks on the subject of the central and side buffers.

I have, &c.

NICHOLAS J. BROWN, Minister of Lands and Works.

C. H. GRANT, Esq., Manager
T.M.L.R. Company.

Public Works Office, Hobart, 30th July, 1884.

TASMANIAN GOVERNMENT RAILWAYS.

SIR,

I HAVE the honor to acknowledge the receipt of Mr. Grant’s letter of 23rd instant, forwarded by you for my remarks.

Mr. Grant was informed when he inspected the model that automatic couplings were not to be used, and expressed his pleasure thereat.

I do not think that any satisfaction can result from further correspondence, and would suggest that the whole matter be left now to actual practical test. I would, however, just remark that the

Government Locomotive Superintendent positively denies the statement "that in the newly-constructed lines in the Colony of Victoria, where curves have been reduced for economical reasons, it has been found necessary to *abandon* the system of *tight couplings*." He states that this is entirely the reverse of what is *actually* the case, the fact being, that upon these particular lines *screw couplings* have recently been introduced, where previously only links were used; and this has been done for the *sole* purpose of steadying the vehicles.

I have, &c.

JAMES FINCHAM, *Engineer-in-Chief*.

The Hon. the Minister of Lands and Works.

*Tasmanian Main Line Railway Company, Limited,
General Manager's Office, Hobart, 5th August, 1884.*

SIR,

HAVING been invited on Saturday last by Mr. R. W. Lord to see the new rolling stock imported for the Government railways, which was kindly shown us by Mr. Batchelor, I could not but feel impressed with the great risk there would be in running such stock on the Main Line Railway, and therefore sent you a telegram and was honored with your reply, for which I have to express my best thanks.

The gravity of the matter was the more impressed upon me in that I had just received an important letter from Mr. R. C. Patterson, the Chief Assistant Engineer of the South Australian Railways, who is doubtless well known to you as having great experience in railway construction, and to have given considerable attention to the construction of broad and narrow gauge rolling stock. This letter was in reply to a note I addressed him asking to be favoured with a copy of the report just made by Mr. Mais, the Engineer-in-Chief, as a result of his visit to England and America. In doing this I incidentally mentioned that such report would have a greater interest to me in that a difference of opinion existed in this Colony as to whether stock with double buffers tightly coupled together could be safely run over the Main Line Railway. On this Mr. Patterson observes:—

"Double buffers for 3ft. 6in. stock (on lines having 5-chain curves), rigidly coupled, will prove a complete failure, and the vehicles will easily become derailed. For narrow gauge lines with sharp curves, the central buffer is the best. We have found the double buffers apt to get locked by one sliding past the other on sharp curves, and they could not get back to the proper position."

This is one of the evils that seems to me to be entirely unavoidable under the new system.

Mr. Cundy, for his own satisfaction, addressed the Locomotive Superintendent of the Victorian Railways, who has more stock under his charge than any other professional authority in these Colonies, and he advises that central buffers would be the best for the Main Line Railway. His remarks are:—

"I believe you have numerous curves upon the Main Line of 5 or 5½ chains radius (330 and 363 feet). A well arranged side buffer might be used, if the distance be not too far apart, but even then they should not be coupled tight. Our American cars with side buffers are prohibited from being coupled tight, notwithstanding our curves are 800 feet radius."

"On a narrow gauge railway with curves like you have I should think a good designed central buffer would be preferable, as it forms a knuckle-joint."

"The buffing system should be as uniform as possible,—the goods stock and the passenger stock,—so as to couple together when it is necessary to run mixed trains."

This advice has especial reference to his practical experience in working the Victorian double buffer stock round the comparatively easy curves of the Gippsland and other new railways.

Since my exceptions to the double buffer design were made without consultation with other authorities, and as a result of my experience only, the correspondence between us would make it appear that I was seeking to force an useless and obsolete design on the Government for some purposes of my own, or to vindicate its use on the Main Line: but in previous letters I have shown you that my critics entirely misunderstood our plans; while the particulars herein given, added to the admitted New Zealand practice, prove that the weight of colonial opinions are on my side.

I must therefore again express the hope that so soon as sufficient of the new stock is fitted up to form a train, it should be thoroughly tested on the Main Line Railway, in which trial I shall be happy to give every assistance desired.

I have, &c.

C. H. GRANT.

Hon. N. J. BROWN, M.H.A., Minister of Lands and Works.

REFERRED to the Engineer-in-Chief for perusal and remarks.

NICHOLAS J. BROWN.
6. 8. 84.

FORWARDED to the Manager L. & W. Railway for his remarks, by direction of the Hon. the Minister.

J. FINCHAM, *Engineer-in-Chief*.
6. 8. 84.

I THINK a practical test will be better than all the paper arguments.

R. W. LORD.
30. 8. 84.

RETURNED to the Hon. the Minister. Provision having been made from the first for running the Government stock with central buffers on the Main Line if the Manager preferred it, I think he should be satisfied, and leave the Government lines to be worked with side buffers if their officers so advise and the Government approves.

J. FINCHAM, *Engineer-in-Chief*.
1. 9. 84.

Tasmanian Main Line Railway Company, Limited,
General Manager's Office, Hobart, 9th August, 1884.

SIR,

I FEAR you will think I am more pertinacious than discreet in so continually intruding upon you the question of double *versus* single buffers, but trust you will not doubt that my only reason for doing this is the extreme importance of the matter to the profitable and convenient working of the Railway system of this Colony.

Were I to need any other justification, it would be in that you have been reported on several occasions as stating that my avowed preference for the single buffer system was dictated only by the consideration of its being the plan adopted on the Main Line Railway, although this was a greatly inferior and antiquated plan as compared with that the Government propose to use. I do not presume to question the sincerity of these remarks, doubtless founded on the professional information given you, but hope that the evidence I have already adduced will to some extent have affected your views.

By the Orient mail which this day arrived, I am favoured with an unofficial letter from the Chairman of this Company, who has evidently been in some manner informed that the buffer question is now being discussed in this Colony, and thereupon consulted a gentleman who is at the present time recognised as one of the best (if not the very highest) English practical authority on the matter of rolling stock, viz., Mr. F. W. Webb, the Locomotive Engineer of the London and North-Western Railway in England, a system on which I find by the last published report there are no less than 59,868 vehicles running belonging to the Company, besides an enormous number of vehicles owned by Railways and Trading Companies for which he is to some extent responsible, and all of which are worked on the double buffer system, the gauge being 4 feet 8½ inches. Mr. Webb affirms that had he to design rolling stock for a new country having no railways established he would employ the single buffer, because it is more convenient, allows of an easier adaptation of the various carriages composing a train, and facilitates their passing round sharp curves as used on narrow gauge railways in America and India, as also on the smaller lines in England.

Mr. Sheward adds that the central buffer system is used in the Isle of Man, and that the Company are well content with it; and that it is also employed on the South Indian Railway, some 850 miles long, and was at once adopted when the change of gauge was carried out.

I have, &c.

Hon. N. J. BROWN, *M.H.A., Minister of Lands and Works.*

C. H. GRANT.

FORWARDED to the Engineer-in-Chief.

NICHOLAS J. BROWN.
11. 8. 84.

FORWARDED to the Manager Launceston and Western Railway for return with last letter from Mr. Grant.

J. FINCHAM, *Engineer-in-Chief*.
11. 8. 84.

I THINK Mr. Grant's apprehensions are ridiculous.

R. W. LORD.
30. 8. 84.

RETURNED to the Hon. the Minister. I think no good can be derived by prolonging this correspondence.

J. FINCHAM, *Engineer-in-Chief*.
1. 9. 84.