Public Works (1897) Department.

SERIAL
No. 2

G.O., No. 21 R

DATED 11 January

[Despatch Abstract.]

Honorarium: Letter to the Govt of India forwarding for favourable consideration an application from Mr G.K. Winter Telegraph Engr Madras Ry; for an — for his System of Electrical Communication in trains.

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[P.W. 24.
5,000—30-11-96.]

Indexed. 1897

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

MADRAS RAILWAY COMPANY,
TELEGRAPH ENGINEER'S OFFICE,
ARKONAM, *24th November* 1896.

No. 1889.

DEAR SIR,

I have been given to understand that at last my system of Intercommunication in trains is most likely to be adopted, at all events, on all State lines in this country, and although the patent has expired, yet, I think, if the Government were addressed on the subject through an influential channel, they would waive the question of the lapse of the patent in deciding the question of an honorarium.

Even if the patent were still in force, I would have no greater claim against Government than I have at present and the delay in the adoption of the system generally has been through no fault of mine. May I ask you to kindly bring the subject before the local Government with a view to its being brought to the notice of the Government of India with such support as you and the Consulting Engineer are able to give.

I think you are perfectly aware of the history of the introduction of the system on the Madras Railway, but as regards its introduction on the Rajputana-Malwa Railway and the subsequent correspondence with that Railway and with the Government of India, some of the following particulars are probably not available in your office :—

Early in 1883, the Government of India applied for my services to introduce the system on the mail trains on the Rajputana-Malwa Railway, and accordingly I went accompanied by an Inspector and workmen. A train was fitted up and tested by the Railway Officials and Col. Stanton, the then Director-General of Railways, with satisfactory results. I then returned to Arkonam leaving the Inspector and workmen behind to carry out the remainder of the work.

I was subsequently asked for details in order to enable them to prepare an estimate of the cost of the work. This I furnished adding the following para. to my covering letter :—

"The Royalty or honorarium is not included in the above figures, and has not yet "been settled between the Government of India and myself. As such honorarium will pro- "bably include the use of the system throughout the State lines, I think it need not be "entered in your estimate, nevertheless, it would be well to remark in the estimate that pro- "vision for such honorarium has not been made."

To this I received a letter asking me to say exactly how I proposed to charge the Royalty.

To this I replied as follows :—

"I should wish to treat the whole of the British Indian State lines as one Railway, "and it is my intention to ask for an honorarium from the Government in lieu of Royalty "for the use of the system on all such lines as soon as it is in use and approved of on the "Rajputana-Malwa State Railway. In the meantime, however, I think the following arrange- "ment which I intend to apply to Guaranteed and Foreign State Lines, may be considered "as applicable to the Rajputana-Malwa Railway, and any amount so received may be taken "into account in settling the question of the honorarium hereafter :—

"If on any Railway only a limited number of vehicles are to be fitted, say under "500 altogether, the Royalty will be Rs. 10 per vehicle, but if a larger number are to be fitted "as on the Madras Railway, the Royalty will be Rs. 3 per vehicle with a minimum of Rs. 5,000, "which sum will cover the Royalty on 1,666 vehicles."

To this I received a reply that the Government of India had called for a report of the working of the system after a year's trial, pending submission of which orders on the question of honorarium would be deferred.

This report was submitted in due course in which the following para. giving the result of the year's working occurs at the end :—

"The evidence of this experiment shows that, after making due allowance for "mistakes made by the staff in working a system of this kind for the first time, and also for "the defects in the trembling striker bells, which have since been removed, the trial has, on "the whole, been eminently successful, and that the working cost is moderate. The Capital "and Working costs have been carefully worked out for the information of the Government "of India, and for the Agent and Board of Directors of this Railway, to enable them to "decide therefrom whether it is desirable or not to adopt the system for general use in this "and State Railways."

The report is accompanied by the following note by Consulting Engineer to the Government of India for State Railways :—

"The reports on the working of Mr. Winter's Electrical Communication between "Guard and Driver are, I consider, very satisfactory, and I think that the arrangement may, "with advantage, be more extensively used on State Railways."

On receipt of a copy of this report, I wrote to the Director-General of Railways asking him to bring the subject of my honorarium for the favourable notice of Government.

In reply, I was told that the matter of the introduction of my system was still under discussion, and that it would be better for me to wait for the result before raising the question of an honorarium.

This last letter is dated 31st August 1887, and I have had no further communication on the subject of the honorarium, although, as I have already said, I understand that at last the system is likely to be introduced generally.

I am about to get the correspondence printed so as to be more easily read, but the gist of the matter is given above. I may add that up to date, I have received no Royalty or recognition of any kind for the use of the system on the Rajputana-Malwa Railway either from Government or the Bombay, Baroda and Central India Railway.

Yours faithfully,

G. K. WINTER,
Telegraph Engineer.

THE ACTING AGENT AND MANAGER,
Madras Railway Company.

SERIA

No. 1728. RAJPUTANA-MALWA RAILWAY.

FROM

THE CARRIAGE AND WAGON SUPERINTENDENT,
Rajputana-Malwa Railway,
Ajmere,

To

G. K. WINTER, ESQ.,
Madras Railway,
Arkonam.

DATED AJMERE, *26th April* 1883.

Has the honor to request he will be good enough to inform undersigned what his charges are for various materials used in Electrical Inter-communication sent from Madras, as the Manager has called for an estimate of the same.

(Signed) W. P. JOHNSON,
for *Carriage and Wagon Suprintendent.*

MADRAS RAILWAY COMPANY,
TELEGRAPH ENGINEER'S OFFICE,
ARKONAM, *4th May* 1883.

No. 226.

To

THE CARRIAGE AND WAGON SUPERINTENDENT,
Rajputana-Malwa Railway,
Ajmere.

MY DEAR SIR,

In accordance with the request contained in your letter, No. 1728, dated 26th April 1883, I beg to enclose a list of stores already supplied together with their value. I also send a separate price list which will doubtless help you in framing your estimate.

Hooper's Core and Leclanche Cells in Ebonite Chambers, we are unable to supply you with. Kindly order the quantity of Hooper's Core you require from the Government Telegraph Department. The Leclanche Cells in Ebonite Chambers are made by

"The India Rubber Gutta Percha and Telegraph Works Company,
Silvertown, London."

Apparatus for giving break-away signal, if required, you may estimate at Rs. 5 per vehicle.

My Inspector Vencatachellam will give you details of labor and railway fares for men sent from Arkonam.

My salary and allowance for one month, say Rs. 1,118-10-2, will have to be added to the general estimate.

The Royalty or honorarium is not included in the above figures and has not yet been settled between the Government of India and myself. As such honorarium will probably include the use of the system throughout the State lines, I think it need not be entered in your estimate, nevertheless, it would be well to remark in the estimate that provision for such honorarium has not been made.

Yours very truly,
(Signed) G. K. WINTER,
Telegraph Engineer.

RAJPUTANA-MALWA RAILWAY,
26th July 1883.

D. O. No. 3212.

FROM

THE CARRIAGE AND WAGON SUPERINTENDENT,

To

G. K. WINTER, ESQ.

The Manager desires that your Royalty charges may also be included in the estimate to be submitted for fitting Electric Inter-communication to Mail trains. Please say exactly how you propose to charge your Royalty.

(Signed) W. S. JOHNSON,
for *Carriage and Wagon Superintendent.*

MADRAS RAILWAY COMPANY,
TELEGRAPH ENGINEER'S OFFICE,
ARKONAM, *7th August* 1883.

No. 313.

To

THE CARRIAGE AND WAGON SUPERINTENDENT,
Rajputana-Malwa Railway,
Ajmere.

MY DEAR SIR,

Your D. O., No. 3212, *dated 26th July* 1883.

In answer to your letter of 26th July 1883, I beg to inform you that, as stated in my former letter, I should wish to treat the whole of the British Indian State lines as one Railway, and it is my intention to ask for an honorarium from Government in lieu of Royalty for the use of the system on all such lines as soon as it is in use and approved of on the Rajputana-Malwa State Railway. In the meantime, however, I think the following arrangement, which I intend to apply to Guaranteed and Foreign State lines, may be considered as applicable to the Rajputana Railway, and any amount so received may be taken into account in settling the question of the honorarium hereafter.

If on any Railway only a limited number of vehicles are to be fitted, say under 500 altogether, the Royalty will be Rs. 10 per vehicle; but if a large number are to be fitted as on the Madras Railway, the Royalty will be Rs. 3 per vehicle with a minimum of Rs. 5,000, which sum will cover the Royalty on 1,666 vehicles.

Yours very truly,
(Signed) G. K. WINTER,
Telegraph Engineer.

No. 653A.

RAJAPUTANA-MALWA RAILWAY,
MANAGER'S OFFICE,
AJMERE, *4th February* 1884.

To

G. K. WINTER, ESQ.,
Telegraph Engineer,
Madras Railway Company,

(Through the Agent and Manager, Madras Railway Company, Madras).

DEAR SIR,

With reference to your letter, No. 313, of 7th August 1883, to the Carriage and Wagon Superintendent of the Railway, on the question of the grant of an honorarium to you for the use of your Electric Inter-communication in trains on this line, I beg to inform you that the Government of India have called for a report on the working of the system after a year's trial, pending submission of which, orders on the question are deferred.

Yours faithfully,
(Signed) H. DANGERFIELD,
Officiating Manager.

MADRAS RAILWAY COMPANY,
TELEGRAPH ENGINEER'S OFFICE,
ARKONAM, *31st July* 1887.

No. 539.

FROM

G. K. WINTER, ESQ.,
Telegraph Engineer,
Madras Railway,
Arkonam,

To

THE DIRECTOR-GENERAL OF RAILWAYS,
Simla.

SIR,

I have the honor to remind you that when it was decided to use my system of intercommunication on the Rajputana-Malwa Railway it was settled that the question of honorarium should remain in abeyance until reports of its working on that line should be submitted after a year's trial. This report was sent to your office under cover of a letter from the Under Secretary to the Government of India, No. 632 R. T., dated 26th June 1886, copy enclosed and the report was so favorable that the Consulting Engineer for State lines recommended the extension of its use, and estimates were asked for, for applying it to lines under your control. Under these circumstances, I should be greatly obliged if you would take the question of an honorarium into consideration.

I am quite aware that, although the system is protected by two Indian patents, I can make no claim for Royalty on Government; yet I believe that in most cases in which Government makes use of an invention, the inventor receives an honorarium, and I trust that in the present case it will be considered that the system is of sufficient utility and importance to merit recognition at the hands of Government. I believe that the recommendation for such recognition rests with you, and I trust you will kindly see your way to bring the subject under the favorable notice of Government.

I have the honor to be,
Sir,
Your most obedient servant,
(Signed) G. K. WINTER,
Telegraph Engineer.

No. 812 T.

FROM

THE DIRECTOR-GENERAL OF RAILWAYS,

To

G. K. WINTER, ESQ.,
Telegraph Engineer,
Madras Railway, Arkonam.

SIMLA, 31*st August* 1887.

SIR,

I have the honor to acknowledge the receipt of your letter, No. 539, dated 31st July 1887, requesting a consideration of the question of honorarium for the use on State Railways in India of your patent system of Electrical Inter-communication between Guard, Driver and Passenger.

In reply I have to inform you that the matter of the introduction of your system is still under discussion, and it would appear better for you to await the result before raising the question of the honorarium.

I have the honor to be,

Sir,

Your most obebient servant,

(Signed) G. F. WILSON, CAPTAIN, R.E.,
for *Director-General.*

Documents accompanied—*Nil.*

PRINTED BY H. PLUMBE AT THE LAWRENCE ASYLUM PRESS, MOUNT ROAD, MADRAS—1896.

No. 632 R. T.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

RAILWAY TRAFFIC.

To

THE DIRECTOR GENERAL OF RAILWAYS.

Simla, June 26, 1886.

SIR,

With reference to the correspondence ending with Public Works Department letter No. 65 R. T., dated 22nd January 1884, I am directed to forward for information copy of a report on the results of the working of Winter's System of Electrical communication between Guard, Driver and Passenger on the Rajputana-Malwa Railway, with copy of a note thereon by the Consulting Engineer to the Government of India for State Railways, and to request the submission of estimates of the cost of introducing the system on the Railways under your control.

2. The estimates of the cost of fitting the communication to the goods vehicle stock should be kept quite separate from that for the passenger vehicle stock.

I have the honor to be,

SIR,

Your most obedient Servant,

FRED. FIREBRACE, Major, R.E.,
Under Secretary.

Documents accompanying.

1. Report on trials of Winter's Electrical communication on the Rajputana-Malwa Railway.

2. Note by the Consulting Engineer to the Government of India for State Railways.

Copy, with copy of enclosures, forwarded to the Local Governments, Administrations and Officers noted in the margin for information.

The Governments of Madras, Bombay, Bengal and North-Western Provinces and Oudh.
The Chief Commissioners of the Central Provinces, British Burma, and Assam.
The Residents, Hyderabad and Mysore.
The Agent to the Governor General for Rajputana.
The Consulting Engineers to the Government of India for Guaranteed Railways.

By order,

FRED. FIREBRACE, Major, R.E.,
Under Secretary.

Enclosures Nos. 1 and 2 to Public Works Dept. letter No. 632 R. T. of 1886.

BOMBAY, BARODA AND CENTRAL INDIA RAILWAY

INCLUDING

RAJPUTANA-MALWA RAILWAY.

[1]

Report by the Carriage and Wagon Superintendent, Rajputana-Malwa Railway, on trials of Winter's System of Electrical Inter-communication between Guard and Driver and Passenger and Driver, as applied to the through Mail Service trains on the Rajputana-Malwa Railway.

In accordance with the intimation conveyed by the Government of India in the correspondence marginally noted, Mr. Winter, the Electrician of the Madras Railway arrived in Ajmere on the 15th of March 1883, bringing with him leading hands and also materials sufficient to complete one mail train according to his method of application, the details of which have already been submitted to the Government of India in pamphlet form.

Gonernment of India No. 17, dated 6th January 1883, to the Madras Government, and their reply No. 81, dated 22nd June.
Director General of Railways' No. 024, dated 10th January 1883, to Manager, Rajputana-Malwa Railway.

The first train, composed of one Engine, twelve Passenger Vehicles, one Post Office Carriage, one Luggage Van, and two Brake-vans was completely finished and inspected by the Director General of Railways (then on tour at Ajmere) and the Manager of this Railway on the 30th March 1883.

Leaving the work of fitting up the next train in progress, Mr. Winter left for Madras about the 1st of April 1883.

Estimates* amounting to Rs. 15,906 were then submitted and sanctioned for fitting up the following engines and coaching vehicles :—

Official Meeting No. 18 of 1883, Resolution No. 579.

38 *Passenger Engines.*

	6	Royal and State Saloons.
	5	Ambulance Carriages.
	2	Cooking Vans.
	14	Luggage Vans.
	24	Passenger Brake-vans.
	200	Through mail train passenger vehicles.
Total ...	251	Vehicles.

Causes of delay in bringing the system into regular operation.

The progress of the work of fitting up the vehicles and engines was retarded by many causes, namely :—

i.—Paucity of stock through the opening of the Rewari-Ferozepore Section before the complement of stock for this Railway had arrived from England.

ii.—Delay in preparation of fittings for Engines in Locomotive Department.

iii.—Alteration in Engine Service, necessitating the fitting up of O Class as well as M Class Engines.

iv.—Failure of Madras Railway Stores to supply 23 Brake-van Batteries and their having to be indented for from England.

v.—The arrival of the Leclanché Batteries from England in a seriously damaged state necessitating troublesome repairs.

Although the whole of the 251 Coaching Vehicles named above were completed by the Carriage and Wagon Department, so far as their cable connections, plungers, wire, &c., were concerned, by the 30th of October 1883, there was but one Engine ready. Then from the other causes of delay enumerated, the system of working the electrical inter-communication did not come into proper operation until the 10th of November 1884, by which time the following coaching vehicles and engines were fitted up and put into running

Vehicles	270
Engines	52

and 40 pairs of bridging ropes (to establish connection when unfitted vehicles were attached to trains) were supplied to the Traffic Department.

---

* These estimates included abnormal charges, such as Mr. Winter's pay, fares of workmen, carriage of tools and materials from Madras, &c., which would not occur in subsequent estimates.

Working Results.

A careful record of train duty and interruptions from all causes has been compiled from out-station daily reports. The following are the results:—

From the 10th November 1884 to the 31st December 1885, namely, 415 days, the actual total duty of the through mail trains between Delhi and Agra to and from Ahmedabad has been ... ... 571,455 train miles.

Royal and Special trains	2,876	„ „
Total train miles	574,331	

The total number of interruptions of every description, rendering the system temporarily inoperative, was 133. Of these, 91 were due to 42 cases of engines, and 49 cases of vehicles being unfitted; in some cases being unprovided with bridging ropes. Of the latter cases, 21 happened between Ahmedabad and Sabarmati, in vehicles carrying railway servants across the Sabarmati bridge, and six were due to the line being washed away, and unfitted vehicles being unavoidably attached to trains.

These 91 cases caused an interruption for 1,350 train miles only. The net duty of properly fitted vehicles and engines was, therefore, 574,331 minus 1,350 or 572,981 train miles, and the number of interruptions for this latter duty was, therefore, 133 minus 91, or 42 cases, the analysis of which is as follows:—

(*a*)	Due to defective adjustment of engine signal bells	21	
(*b*)	Breaking of part of bell on the road	1	
(*c*)	Wilful damage of bell by engine driver	1	
		—	23
(*d*)	Breaking of cables—through rough usage by shunting staff		5
(*e*)	Damaged bridging ropes—through improper application and rough usage by staff		3
(*f*)	Failure of Batteries for want of attention by Carriage and Wagon staff		4
(*g*)	Failure of train staff to couple up side chains and establish connection		1
(*h*)	Causing contact, by hooking side chains of rear vehicle across		1
(*i*)	Derangement of cables and connections in ordinary work		5
	Total ...		42

The 21 cases of failure of signal bells form half of the whole number,—namely, 42 valid cases—and are due to an experiment made by Mr. Winter, in the trial of a "trembling striker" for the bell, with a view to the introduction of a "break away" signal. The adjustment of this bell is delicate and no less than eight cases of failure were clearly traced to the unnecessary interference on the part of Carriage Examiners ignorant of the work. Mr. Winter has now substituted a more simple form of striker, and although eight engines have been fitted up with them and put into running since October 1885, there has been no instance of failure in this form of bell.

Cases (*b*) and (*c*) explain themselves.

Cases (*d*) are mostly due to bad wire in the cables; and probably to rough usage in throwing the chains over the sharp angles of the buffer heads.

Cases (*e*) are traced to the traffic staff allowing the bridging ropes to trail on the ballast; and in some cases to allowing the wheels to pass over them.

Cases (*f*) need no explanation. They occurred during the first six months of the experiment and are not likely to occur again often.

Cases (*g*) and (*h*) require no explanation.

Cases (*i*). These are pure cases of derangements of connections. The five cases happened during the first six months of the experiment. No cases have since been reported.

Now that the defects in the bells are cured the actual faults will be practically confined to cases (*f*) and (*i*).

Percentage of Faults.

The interrupted mileage actually run for the 42 cases has been 3,788 train miles; the percentage of faults is, therefore, $\frac{3,788 \times 100}{572,981} = 0{\cdot}66$ per cent. But if we deduct the failures of engine bells and the palpable cases of negligence and ignorance, there are but

five other cases due to faults in the connections. These represent an interrupted duty of 324 train miles. This would give $\frac{324 \times 100}{572,981} = 0{\cdot}06$ per cent. of faults on the total train mileage, extending over a period of 415 days, with five through mail trains on the road each day, besides occasional special trains.

Sanctioned estimates up to the 31st December 1885.

Appendix A exhibits in detail the sanctions for fitting up electrical inter-communication up to the end of 1885, amounting to Rs. 32,586.

The present sanctions provide funds for fitting up the following:—

Coaching Vehicles	600	
Cleminson Covered Goods Wagons ...	12	
	—	612
Locomotive Engines		63

The progress of the work under these sanctions up to the end of 1885 was as follows:—

Coaching Vehicles	473	
Cleminson Wagons	12	
	—	485
Locomotive Engines		61

The balance to be completed was therefore—

Coaching Vehicles	127
Locomotive Engines	2

The Rs. 32,586 provides about Rs. 4,700 for abnormal charges incident to the first introduction of the system, which necessitated the cost of supervision by Mr. Winter, special assistants, fares of workmen, and carriage of materials from Madras. These charges amount to about 24·3 per cent. on the gross estimates; but it is anticipated that a saving of about Rs. 3,000 will result by having executed recent work locally. It therefore follows that future work of this sort will be proportionately cheaper. The following is the *present* approximate cost of a mail train, after deducting the anticipated saving, and allowing the proportion of Locomotive Engines to work each train.

	Rs.
20 Coaching Vehicles @ Rs. 36	720
2 Engines	204
Total ...	924

But it is anticipated that *future* work can be done at the following rates per Vehicle and Engine:—

Double 1st class, Composite, and 2nd class Carriage, each—

	Rs. A. P.		
Cable and wire...	19 0 0		
2 Plungers and wire connections	11 0 0		
Supervision at 10 per cent.	3 0 0		
		33	0 0
The above with one compartment only, and Postal Vans ...	33 0 0		
Deduct cost of 1 Plunger	5 8 0		
		27	8 0
3rd class, Intermediates, Horse Boxes, Luggage vans, and Wagons, each	33 0 0		
Deduct cost of Plungers	11 0 0		
		22	0 0
Guards' Brake-vans, each—			
Cable and wire connections	22 0 0		
2 Plungers	13 0 0		
1 Battery (10 cells with connections)	44 0 0		
Supervision charges at 10 per cent.	8 0 0		
		87	0 0
Locomotive Engines, each—			
Cable and wire connections	48 0 0		
Engine signal bell and connections	29 0 0		
Supervision charges at 10 per cent.	8 0 0		
		85	0 0

The cost of a mail train of maximum composition and its complement of engines, calculated from the above rates would be :—

			Rs.	A.	P.	Rs.	A.	P.
2	Passenger Brake-vans	@	87	0	0	174	0	0
1	Postal Van	@	27	8	0	27	8	0
3	Luggage Vans	@	22	0	0	66	0	0
4	Double 1st class and Composite Carriages	@	33	0	0	132	0	0
4	Saloons, 1st and 2nd	@	27	8	0	110	0	0
1	Intermediate Carriage	@	22	0	0	22	0	0
5	3rd class Carriages	@	22	0	0	110	0	0
20	Vehicles					641	8	0
2	Locomotive Engines	@	85	0	0	170	0	0
	Total ...					811	8	0

Depreciation, Repairs, Maintenance and extra Supervision.

Depreciation.—Mr. Winter telegraphs that the "life of plungers, engine bells and line were indefinite." I think myself that they should not be taken at any time beyond the average life of vehicles and engines; or say 7½ per cent. per annum.

Repairs and Renewals.—The cost of petty repairs and renewals may be taken at 2½ per cent., and the cost of charging and refreshing Batteries at Rs. 10 per Brake-van, per annum.

Supervision and extra labour.—The present cost of supervision and extra labour debitable to the present experiments is as follows :—

		Rs.
6	Out-stations @ Rs. 150 per annum	900
1	Travelling Inspector	1,200
	Total ...	2,100

If, however, the electrical signalling system were applied universally to the Passenger and Goods Services, the cost of special supervision and extra labour would probably not exceed Rs. 5,000 per annum.

The total passenger and goods mileage for the year 1885 was 5,677,859 train miles; out of this the through mail service performed 502,605 train miles. Then on a train mileage basis the amount fairly chargeable to the mail train service would be $\frac{502,605 \times 5,000}{5,677,859}$ or Rs. 442·95 per annum for the through mail service only.

The proportion of vehicles and engines actually required to work the mail service would be as follows :—

VEHICLES.

	No.
Trains of Coaching Vehicles in actual running each day	5
Spare trains for reserves and for vehicles under petty repairs ...	2
Trains undergoing repainting and heavy repairs	1
Total trains of Vehicles ...	8

ENGINES.

In running daily	8
Under repairs	3
Total Locomotive Engines ...	11

The Capital cost of providing Vehicles and Engines exclusively for the through mail service only, when taken at *present* rates, would therefore be :—

		Rs.	Rs.
8	Trains of Coaching Vehicles at	720	= 5,760
11	Engines (Locomotive) at	102	= 1,122
	Total cost of electrical communication for the through mail service only		6,882

From the foregoing data, the probable annual cost of electrical inter-communication, as applied to the through mail service would be :—

	Rs.
Depreciation on Rs. 6,882 at 7½ per cent.	515·4
Repairs and petty renewals at 2½ ,, ...	171·8
Refreshing and replenishing 16 batteries at 10 each ...	160·0
Supervision and extra establishment	442·6
Revenue cost per annum for the through mails	1,289·8

The train mile cost would therefore be $\frac{1289·8 \times 16 \times 12}{502,605} = 0·493$ pies per train mile :

or per train per day $\frac{1289·8}{365 \times 5} =$ Rs. ·707

Probable cost of fitting up the whole of the Vehicle and Locomotive Engine Stock.

Including previous expenditure, the cost of fitting up the whole of the vehicle and Engine Stock of the Rajputana-Malwa Railway System (including all vehicles under erection and supply) is estimated at Rs. 2,24,581.* Of this sum Rs. 32,586 has been sanctioned, leaving Rs. 1,91,995 to be provided, if it is desired to apply this system universally.

* *Vide* Appendix B.

Probable future cost of Depreciation, Repairs, Maintenance, and Extra supervision, if the System is universally applied to all the Passenger and Goods Services.

	Rs.
Depreciation on Rs. 2,24,581 at 7½ per cent.	16,843·575
Repairs and petty renewals at 2½ ,, ...	5,614·525
Refreshing and replenishing 256 Brake-van Batteries at Rs. 10 each	2,560·000
Supervision and extra labour	5,000·000
	30,018·100

Taking the train mileage at no more than that for the year 1885, namely, 5,677,859 train miles, the average cost per train mile would be :—

$\frac{30,018 \times 16 \times 12}{5,677,859} = 1·015$ pies per train mile.

The above is the average cost when the whole of the following are employed :—

Locomotive Engines		366
Coaching Vehicles	1,356	
Goods Vehicles	6,297	
		7,653

But, if the Through Mail mileage were deducted, the cost for the balance would be more.

It would, therefore, appear that by reason of the high mileage duty of the mail trains as compared with the other services, the cost per train mile is more favourable for the former. Put more graphically, $\frac{1}{15}$th of the whole stock is engaged in the through mail service, and does about $\frac{1}{10}$th of the whole train mileage, while $\frac{17}{18}$ths of the stock only does $\frac{9}{10}$ths of the whole train mileage. In other words, the mail train vehicles do nearly five times the annual duty of the average of the other vehicles; hence for the capital cost, and the annual cost computed from it, the proportionate duty is greater, and consequently the train mileage costs less than the average.

The principal feature in Mr. Winter's system is that he utilizes the side or safety chains of vehicles to produce electrical contact, and when the vehicles of a train are coupled up in the ordinary way, electrical contact is established without any special effort on the part of the marshalling or train staff.

As I before pointed out in the correspondence marginally noted, good Railway practice sanctions the use of side chains, although it has not hitherto been the practice on Indian Metre Gauge State Railways; therefore, before we could apply Mr. Winter's system to the whole stock, it would be necessary to provide over 7,400 sets of side chains at an extra cost of Rs. 2,22,000, so that the total capital outlay would be :—

Manager Rajputana-Malwa Railway's No. 1569 of 7th February 1883, to Carriage and Wagon Superintendent, and Carriage and Wagon Superintendent's reply No. 630, dated 14th February 1883.

	Rs.
For Side chains	2,22,000
Electrical Gear	2,24,581
Total ...	4,46,581
Deduct, previous sanction	32,586
Balance to be provided	4,13,995

The evidence of this experiment shows that, after making due allowance for mistakes made by the staff in working a system of this kind for the first time, and also for the defects in the Trembling Striker-bells, which have since been removed, the trial has, on the whole, been eminently successful, and that the working cost is moderate. The Capital and Working costs have been carefully worked out for the information of the Government of India, and for the Agent and Board of Directors of this Railway, to enable them to decide therefrom whether it is desirable or not to adopt the system for general use in this and State Railways

APPENDIX A.

SANCTIONED ESTIMATES.

No. of Resolution.	Minutes of Meeting. No.	Minutes of Meeting. Date.	Particulars.	As Estimated. No.	As Estimated. Amount.
			Vehicles.		Rs. A. P.
579	18	10th Sep. 1883	Mail Train Vehicles	251	11,271 0 5
371	13	9th June 1884	Cleminson's Wagons	12	444 0 0
20	1	6th Jan. 1885	Officers' Carriages	6	253 8 11
564	19	8th Sep. 1884	Carriages for Rewari-Ferozepore Railway	143	6,763 6 4
617	19	24th ,, 1883	Third Class Carriages	80	2,309 9 7
288	10	2nd June 1885	First Class Carriages with side doors ...	25	925 4 0
288	10	,, ,, ,,	Ditto ditto end do. ...	28	1,264 3 2
224	7	21st April ,,	Horse boxes	67	1,833 12 7
			Total ...	612	25,064 13 0
			Engines.		
579	18	10th Sep. 1883	Mail train Engines	38	4,635 13 3
435	15	7th July 1884	O Class Engines	15	1,725 0 0
294	10	2nd June 1885	8 Mail and Mixed train Engines ... 2 Pilot Engines	10	1,160 0 0
			Total ...	63	7,520 13 3
			Grand Total ...	...	32,585 10 3

APPENDIX B.

Approximate Estimate for fitting up the whole of the Engines, and Coaching and Goods Stock (except Ballast Wagons, Break-down Vans and Travelling Cranes) with Winter's System of electrical inter-communication.

		Rs.	Rs.
Probable cost of completing 545 Coaching Vehicles and 63 Engines ...		...	27,800·0
Probable cost of fitting up the balance, namely, Locomotive Engines	303 at	85-0-0	25,755·0
Single compartment vehicles with line connections and one plunger	13 ,,	27-8-0	357·5
Double compartment vehicles with line connections and two plungers	114 ,,	33-0-0	3,762·0
Brake-vans with line connections, plungers, and Leclanché Batteries	205 ,,	87-0-0	17,835·0
3rd class and other vehicles with line connections only	479 ,,	22-0-0	10,538·0
Total of Coaching Vehicles and Engines ...		...	86,047·5
Goods Vehicles fitted with line connections only ...	6,702		
Deduct—Ballast Wagons, Travelling Cranes, and Break-down Vans	405		
	6,297 at	22-0-0	1,38,534·0
Grand Total ...		...	2,24,581·5

[2] *Note by the Consulting Engineer to the Government of India for State Railways, dated 7th June* 1886.

The reports on the working of Mr. Winter's Electrical communication between Guard and Driver are, I consider, on the whole, very satisfactory, and I think that the arrangement may, with advantage, be more extensively used on State Railways.

BACK PAPERS.

ENC. No. 1 TO E. R'. C. No. 37 OF 1896
LETTER No. 9661 D 4.1.97
FROM Agt

(A. & M. 1.)

No 9661.

SERIAL No. 1

MADRAS RAILWAY

AGENT AND MANAGER'S OFFICE,

Madras, 4th January. 1897.

Fwt 5/1/97

From forwards index for favourable consideration

Fwt 5/1/97

The Agt. *Agent and Manager.*

Madras Railway Coy.

To

The *Consulting Engineer for Railways.*

Madras.

SIR,

I have the honor to address you with reference to an application (in duplicate) dated 26th November 1896 from Mr. G. K. Winter, the Company's Telegraph Engineer, for an honorarium which it is hoped that the Government of India will be pleased to grant to that officer in view of the extended adoption on State Railways of the system of Electrical Communi-cation in trains which was invented by Mr. Winter and bears his name.

2. In the printed papers which accompany this letter it will be observed that this system of electrical communica-tion was originally introduced on the Madras Railway, and owing to the highly satisfactory results of its working on this line, it was, at the request of the Government of India in 1895, tried on the Rajputana Malwa State Railway where it has proved to be eminently successful, and it is understood that its further introduction on all State Railways is now contemplated.

3. The question of royalty or an honorarium was raised by Mr. Winter at the time of its introduction on the Raj-putana Malwa Railway, but in compliance with the request of the Director General of Railways, the submission of any application

on

on this subject was postponed pending the result of the discussion of the question which was then under consideration.

4. As this took place in 1887 and no decision has been communicated to Mr. Winter up to date, it is requested that the circumstances may be represented to the Government of India, who it is hoped will not allow the fact that the patent has now lapsed to affect their consideration of the application now made.

5. The printed enclosures to this letter furnish full particulars, and it only remains for me to add that the merits and advantages of the system which has been tested and proved on the Madras Railway for so many years cannot be too highly spoken of. Reference is invited to the several half-yearly reports by the Telegraph Engineer which testify to the undoubtedly valuable and efficient character of the invention, the use of which has in many cases averted disaster to trains.

6. The terms which are proposed by Mr. Winter as the basis on which the grant of any royalty or honorarium may be considered are given in his printed letter, and it is requested that you will be so good as to forward this application to the Government of India for their favourable consideration, supported by such recommendation as, in your opinion, the application deserves.

I have the honor to be,

Sir,

Your most Obedient Servant,

Henry Meath

Acting Agent and Manager.

Encls 2

Chief Auditor.

BACK PAPERS

G. No. 37
Recd. 6.1.97

MADRAS RAILWAY.

From

To The Agent and Manager.

Dated

Read.

No.

The Consulting Engineer
for Railways.

R. Form No. 12.

No. 21 R

Government of Madras.

PUBLIC WORKS DEPARTMENT,
RAILWAY BRANCH No. 2

SERV.

To

His Excellency the Governor

THE SECY. TO THE GOVT. OF INDIA,
P. W. DEPARTMENT.
Calcutta

Madras, 11th January 1897.

SIR,

In continuation
of my letter No: 836 R dy
2nd October 1896, I am
directed to forward herewith,
for favourable consider-
ation, the accompanying
application from Mr. G.
K. Winter, Telegraph Engineer
Madras Railway, for an
honorarium for his
System of electrical com-
munication in trains which
it is ~~said~~ instituted, is to be adopted
on all State Railways,
and

A.G.H
8.1.97

H.E.
7.1.97 R/91/97

and in support of his
application, I am also
to forward a copy of letter
hr. 9661/1 of 24 January 1897
from the Agent & Manager
Kendrew Railway with
the remark that Mr.
Cowieson
Boiler is deserving of
this recognition from
Government for his
valuable invention
which has proved
Eminently successful
in its working on the
Kendrew Railway -

6/1/97

Documents Accy:-
Application with Letter
letter from Hon: no: 9661/1 of 24.1.97

11.1.97

SERIAL
No. 4

Public Works (1897) Department.

CURRENT No. 2213

Order No: 798 & 3rd March/97.

Copy forwarded to A.M. with reference to his letter No. 9661/1 of 4th Jany/97

W.E. 2/3/97

per ER

From The Govt. of India P.W.D.

No. 514 G.

Dated 24th February 1897

Received 2.3.97

Enclosures

Spare copies

SUBJECT.

Honorarium to Mr Winter Telegraph Engr. M.Ry:

Orders on an application for an —— for the use of his system of electrical communications in trains on State Railways

Despatched on 3/3/97

BL 2/3/97

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

SERIAL No. 3

All communications should be addressed to the Secretary.

No. 514 *G.*

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

GENERAL.

To

The Joint Secretary to the Government of Madras
Public Works Department, Railway Branch.

Calcutta, the 24th February 1897.

Sir,

I am directed to acknowledge the receipt of your letter No. 21 R., dated 11th January 1897, forwarding an application from Mr. G.K.Winter, Telegraph Engineer, Madras Railway, for an honorarium for the use of his system of electrical communication in trains on State Railways.

2. In reply, I am to state that as Mr. Winter's system of intercommunication between guards and drivers is not in use on any railway now under State management the Government of India are unable to consider the question of granting him an honorarium.

3. In regard to railways not under state management it is considered that Mr. Winter should address the Companies direct in regard to any claim he may think he has against them.

I have the honour to be,
Sir,
Your most obedient servant,

G H Walker

Under Secy. to the Govt. of India.

Documents accompanying:-

Nil.

R.L.

Public Works (1897) Department.

G.O., No. 23. R

DATED 11. January

vide S.O. 78 Rly dy 2.2.97

[Despatch Abstract.]

Station: Letter to the Govt. of India Reporting the Correct spelling in English & Vernacular of the new name Valathoor of the "Valli" on the Madras Railway

[P.W. 25. 5,000—30-11-96.]

Indexed. 19/1

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.