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(2) Date of repair_____

(3) Initials of the Referencer_____

MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No. / B.P. No.	450-57	Press / Mis.
22, 23, 24.		
Dated	2-5-73	1873.

Not to be folded or roughly handled

No. 22. Read the following letter from Lieutenant-Colonel J. H. M. SHAW STEWART, R. E., Consulting Engineer for Railways, to Colonel G. W. WALKER, R. E., Secretary to Government, Public Works Department, dated Madras, 31st March 1873, No. 193 :—

REFERRING to the Resolution of the Government of India, printed with the Proceedings of this Government, under date the 2nd October 1872, No. 2,314, also to paragraph 3 of my endorsement printed with the Proceedings of Government under date the 11th January 1873, No. 99, I have the honour to submit a letter* from the Agent of the Madras Railway Company, accompanied by a report drawn up by Mr. Stoney upon the mode in which it is proposed to give effect to the views expressed by the Government of India upon the subject of cooling carriages during the ensuing hot season.

* No. 181, 10th March 1873.

From R. B. ELWIN, Esq., Agent and Manager of the Madras Railway Company, to Lieutenant-Colonel J. H. M. SHAW-STEWART, R. E., Consulting Engineer for Railways, dated Madras, 10th March 1873, No. 181.

ADVERTING to the correspondence noted in the margin, and to the conversation which took place upon the subject at the meeting held in my office on the 3rd instant, I have the honour to enclose you, for the information of Government, the copy of a report prepared by Mr. Stoney, in which he briefly describes the plan which he proposes shall be adopted on this line during the ensuing hot season for the cooling of passenger carriages.

From Consulting Engineer, No. 819, 8th October 1872.
" " " 1,034, 11th December 1872.

From E. W. STONEY, Esq., C. E., to R. B. ELWIN, Esq, Agent and Manager of the Madras Railway Company, dated Bellary, 7th March 1873.

YOURS No. 749. The method by which I propose to cool Railway carriages is briefly as follows :—

Below the carriage floor and attached by suitable means to the under-framing is a rectangular wooden pipe about 2½ feet wide by 2 feet deep, and extending for about 9 feet in length between the carriage axles; this pipe communicates with the interior of such compartments in the carriage as are proposed to be cooled, by inlets through the floor suitably situated under the seats, covered with perforated zinc or wire gauze, through these inlets cool air is forced in the manner to be hereafter described; a door will be fitted to each inlet, so arranged that the inmates of the compartment can close or open them at pleasure, and so allow cool air to enter in any quantity they please, or not at all.

Within this under-pipe is placed a cylinder of perforated zinc, extending its full length and about 18 inches in diameter, one end of this is closed and the other left open. The end of the wooden box next the closed end of the cylinder is also closed, and the other end has a circular hole in it in which the perforated cylinder exactly fits.

The perforated cylinder is made to revolve slowly by suitable mechanism attached to its axle and the carriage axle, a small roller covered with absorbent cloth kept continually wet revolves in contact with the perforated cylinder, whose surface it always keeps uniformly wet.

The surface of the small roller is kept saturated with water by revolving in a water-tight case in which the water is maintained at a constant level, and supplied as used by a self-acting valve from a tank fixed under the carriage floor; by these means no water except that actually evaporated is used, nor can any be spilled by the oscillations of the carriage.

A small blowing fan arranged to blow in the same direction revolving either way is placed in front of the open end of the perforated cylinder into which it blows, the farther end being closed, this air passes out through the cylinder into the surrounding wooden pipe, and thence into the carriage through the openings provided for the purpose.

In its passage through the perforated zinc it evaporates water from its surface and thus becomes cooled.

The fan is driven by bringing a friction wheel keyed to its axle in contact with the carriage wheel, and draws its air through wire gauze inlets which exclude dust.

The apparatus is so arranged that it is worked by the motion of the carriage, and can be stopped or started by the Guard in a moment simply by moving a handle.

In using this apparatus the windows should be made dust tight, and kept shut as any quantity of fresh cool air for cooling and ventilating a carriage can be supplied by suitably proportioning the size and speed of the fan to the quantity required.

The points chiefly aimed at by the inventor were to provide :—

1*st*.—An ample supply, free from dust, of fresh cool air not too wet, and to force the same into the carriage in a gentle stream, so as to cool it and at the same time ventilate it by continuously pouring fresh air in.

2*nd*.—To provide a durable cooling medium (perforated zinc) in lieu of kus-kus tatties and other perishable materials.

3*rd*.—To keep this cooling medium always thoroughly and uniformly wet, and at the same time to ensure that only so much water as is actually evaporated shall be used, and none wasted by spilling or otherwise.

It is believed that all these conditions will be fulfilled by the proposed apparatus.

I further propose to try a simpler form of the above apparatus, leaving out the fan, and substituting for it bell-mouthed openings at each end of the perforated tube, fitted with doors which can be shut alternately, the one at the front end of the carriage being always open and that in the rear closed. The rapid passage of the carriage through the air will force it through the perforated cylinder, and thence into the carriage, this action will be aided by using exhausting cowls in the roof to produce a partial vacuum in the carriage.

I have also nearly completed two self-acting cooling cowls to be fixed on carriage roofs ; they are so arranged that the same water is used over and over again, and none wasted. They are worked by the wind produced by the motion of the carriage through the air.

These cannot be briefly described without drawings. I hope before the end of this month to submit drawings and descriptions of them.

These cowls are only proposed as a cheap substitute for the more expensive but far more perfect and efficient apparatus at first described.

I shall be happy to show the Consulting Engineer working models of these, and hope to have a model of the first described apparatus before the end of the current month.

I should have replied sooner to your letter but only returned last night from trolly ing over the division.

No. 23. ORDER THEREON, 2nd May 1873, No. 1,250.

RAILWAY, No. 5.

ORDERED that these papers be forwarded for the information of the Government of India.

2. His Excellency the Governor in Council will be glad to be furnished as early as practicable with descriptive drawings of the proposed cooling apparatus, and to be informed whether any, and what, measures are being taken for giving effect to the intentions of the Government of India on the Great Southern of India Railway.

(Here enter No. 1,251, dated 2nd May 1873.)
(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Consulting Engineer for Railways.
Exd S. T. Austin.

PUBLIC WORKS DEPARTMENT.
FORT ST. GEORGE, *2nd May* 1873.

No. 24.

No. 1,251.

FROM

COLONEL G. W. WALKER, R.E.,
Secretary to the Government of Madras,
Public Works Department.

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
Public Works Department.

RAILWAY, No. 6.

SIR,—Adverting to paragraph 4 of the Resolution of the Government of India under date the 11th September 1872, No. 41 R., I am directed to forward the accompanying papers explanatory of the measures which it is proposed to adopt during the ensuing hot season for cooling the carriages of the Madras Railway. Drawings of the apparatus will, I am to add, be transmitted as soon as they are ready.

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

Colonel, R. E.,
Secretary to Government.

Exd. S. T. Austin.

5-

No. 81.

MADRAS RAILWAY.

AGENT AND MANAGER'S OFFICE.

Madras, 10th March 1873

From

R. B. Elwin Esqre,

Agent and Manager of the M&R Co

To

Lieutt Col. J. Kelly R.E. Stewart R.E.

Constulting-Engineer for Railways

Sir,

From Govt Engy
No 819 - 8th April 73
" 1034 - 11 Decr

Adverting to the Correspondence noted in the margin and to the Conversation which took place upon the subject at the Meeting held in my Office on the 7th instant, I have the honour to enclose for the information of Government the Copy of a Report prepared by Mr Storey in which he briefly describes the plan which he proposes shall be adopted on this line during the ensuing hot season for the Cooling of Passenger Carriages.

I have the honour to be,
Sir,
Your most Obedient Servant

Agent and Manager

Railway 7 March 1873.

A. B. Ellis Esqre,

Chief Engineer.

Dear Sir,

I have the honor to forward herewith a Report by Mr. Mallet on the Cauvery Bridge, and to request that you will be good enough to submit it to the Government of India.

Mr. Mallet's report is very full and complete, and I have little to add to it.

The Bridge will consist of 11 spans of 150 feet each, and 2 spans of 100 feet each, with a total waterway of 1750 feet. The piers will be founded on the solid rock, which is found at a depth of 20 feet below the bed of the river, and will be carried up to a height of 10 feet above the highest flood level. The piers will be built of granite masonry in cement, and the superstructure will be of wrought iron lattice girders, with cast iron bed plates. The girders will be 150 feet long, 30 feet deep, and 20 feet apart from centre to centre. The roadway will be 24 feet wide, and will be carried on cast iron cylinders filled with concrete, and sunk to a depth of 30 feet below the bed of the river. The cylinders will be 8 feet in diameter, and will be placed in pairs 20 feet apart from centre to centre. The roadway will be supported on cast iron columns resting on the cylinders, and will be protected by cast iron screens.

The estimated cost of the Bridge is Rupees 7,49,000, and the time required for its completion is 2 years.

I have the honor to be,

Dear Sir,

Your most obedient Servant,

[illegible]

MADRAS RAILWAY.

From

The Agent and Manager.

To

The Consulting Engineer

for Railways.

Dated 10th March 1873

Recd. 11. 3. 73

No. 181.

Forwarding Cabl
of a Report
prepared by M
Mallet on the
subject of
Cauvery Railwa
Carriageo.

P. W. 2106/73.

M. 2 Mar 73 Sh

The perforated Cylinder is made to revolve slowly by suitable mechanism attached to its axle, and the Carriage axle a small roller covered with absorbent cloth kept continually wet revolves in contact with the perforated Cylinder, whose surface is always kept uniformly wet.

The surface of the small roller is kept saturated with water by revolving in a water tight case in which the water is maintained at a constant level, and supplied as mixed by a self acting valve, from a Tank fixed under the Carriage Floor, by these means no water except that actually evaporated is used, nor can any be spilled by the oscillations of the Carriage.

A small blowing Fan arranged to blow in the same direction, revolving either way, is placed in front of the open end of the perforated Cylinder into which it blows, the further end being closed this air passes out through the Cylinder into the surrounding Wooden pipe, and thence into the Carriage through the openings provided for the purpose.

In its passage through the perforated Zinc it evaporates water from its surface and thus becomes cooled.

The Fan is driven by bringing a Friction wheel keyed to its axle in contact with the Carriage wheel, and draws its air through wire Gauze inlets which exclude dust.

The apparatus is so arranged that it is worked by the motion of the Carriage, and can be stopped or started by the Guard in a moment simply by moving a handle.

In using this apparatus the Windows should be made dust tight, and kept shut as any quantity of fresh Cool air for cooling and Ventilating a Carriage can be supplied by suitably proportioning the size and speed of the Fan to the quantity required.

The points chiefly aimed at by the means were to provide.

1st An ample supply free from dust of fresh cool air not too wet; and to force the same into the Carriage in a gentle stream, so as to cool it and at the same time ventilate it by continuously flowing fresh air in.

2. To provide a durable cooling medium, (perforated Zinc) in lieu of Khus Khus Tatties and other perishable materials.

3. To keep this cooling medium always thoroughly and uniformly wet, and at the same time to ensure that only so much water as is actually evaporated shall be used, and none wasted by spilling or other wise.

It is believed that all these conditions will be fulfilled by the proposed

apparatus.

I further propose to try a simpler form of the above apparatus, leaving out the Fan, and substituting for it Bell mouthed openings at each end of the perforated tube, fitted with doors which can be shut alternately, the one at the front end of the Carriage being always open, and that in the rear closed. The rapid passage of the Carriage through the air will force it through the perforated Cylinder, and thence into the Carriage, this action will be aided by using exhausting bowls in the roof to produce a partial vacuum in the Carriage.

I have also nearly completed two self acting Cooling bowls to be fixed on Carriage Roofs, they are so arranged that the same water is used over and over again, and never wasted. They are worked by the wind produced by the motion of the Carriage through the air.

These cannot be briefly described without Drawings, I hope before the end of this month to submit drawings and description of them.

These bowls are only proposed as cheap substitutes for the more expensive but far more perfect and efficient apparatus at first described.

I shall be happy to show the Committee working models

of these, and hope to have a model of the first described apparatus before the end of the current month.

I should have replied sooner to your letter but only returned last night from Scallywag over the Division.

Yours very truly
for E. M. Clancy & Co.

/True Copy/

Agent & Manager.

P. W. 2106/73.
Rd. 2nd May 1873. 22.

Railway Department. CONSULTING ENGINEER'S OFFICE,

No. 193

From

LIEUT.-COLONEL J. H. M. SHAW STEWART, R.E.,

Consulting Engineer for Railways,

To

COLONEL G. W. WALKER, R.E.,

Secretary to Government,
Public Works Department,
Fort Saint George.

SIR,

Referring to the Resolution of the Government of India printed with the Proceedings of this Government under date the 2nd October 1872, No. 2314, also to paragraph 3 of my endorsement printed with the Proceedings of Government under date the 11th January 1873, No. 99, I have the honour to submit a letter† from

† No. 181. 10th March 1873.

from the Agent of the Madras Railway Company, accompanied by a report drawn up by Mr. Stoney upon the mode in which it is proposed to give effect to the views expressed by the Government of India upon the subject of cooling carriages during the ensuing hot season.

I have the honour to be
Sir
Your most obedient Servt.

Madras
31st March
1873

Major Genl. Lt. Col. &c.,
Comr. Engineer for Rys

No 72 Public Works Department

Proceedings of the Madras Government

Read the following

From The Consulting Engineer for Railways, No 2106 dated 31st March 1873

I. Ordered that

these papers be forwarded for the information of the Court of Directors

Ordered that the Secretary do communicate to the Consulting Engineer for Railways the substance of the proceedings as early as practicable with the dispatch of the Despatch, drawing the attention of the Court to the enclosures and requesting that they may be informed whether any such work is intended

Vol 2 Desp & Let pp 22-23
dated 11th June/73 — pp 51-52

P. W. 1873 Department
No. of Letter for Recd

RAILWAY DEPARTMENT.

1872.

From The Consulting Engineer for Railways,

No. 2106.

To

The Secretary to Government,
P. W. Department,
Fort Saint George.

Dated 31st March 1872.
Recd. 1st April/73.

Encl: 2.

No. 193

Submitting letter from Secretary to Govt P. W. Department on the subject of Railway communication to Pondicherry

No 22
6th April/73 R-9

No. 1250-1251-2 dated 1873

On the G. S. of I. Railway

No. 1251 dt. 1257

To The Secty: to the Govt of India

Sir

I am directed to forward the accompanying papers explanatory of the measures which it is proposed to adopt during the ensuing hot season for cooling the Carriages of the Madras Railway. Drawings of the apparatus with, I am to add, be transmitted

To The Chief Engr for Railways

Dated 7-5-73

= mitted as soon as they are ready.

GWW

19

Dept. 7-5-73 with a Copy of No. 1250 of 1873.

h:22.24

Gf. 2106

Govt. of {1873} Madras.

PUBLIC WORKS.

The Consulting Engineer for Railways.

To The Secretary to the Govt of India

Read. Encl 2

G. O. 2 May 1873, No. 1250 & 1251.

Nos. 22-23 & 24

Cooling of Railway Carriages

Passing orders on letter from the Consulting Engineer for Railways on the subject of cooling Carriages during the Ensuing hot Season.

Forwards papers explanatory of the measures proposed for cooling Railway Carriages during the Ensuing hot Season.