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MADRAS RECORD OFFICE

Government of Madras

Public works

DEPARTMENT

G.O. No.	129	Press
B.P. No.		Mis.
255-256		
Dated	20 - 1 -	1874.

Not to be folded or roughly handled

No. 255. 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, 1st December 1873, No. 643 :—

ADVERTING to the minutes of the meeting of the Madras Railway Committee, submitted to Government with No. 608, *No. 966, 21st November 1873, dated the 14th November 1873, I have

the honour to enclose, for the information of His Excellency in Council, a letter* from the Agent of the Madras Railway Company, accompanied by two drawings and a descriptive report from Mr. Stoney of his improved and modified cooling apparatus. Mr. Stoney particularly requests that the description of his apparatus may not be made public for the present.

2. I understand that Mr. Stoney estimates the cost of the modified apparatus, including royalty, at about Rupees 260, the cost of the apparatus as originally designed, being estimated at about Rupees 350.

3. With reference to my letter, dated the 22nd September 1873, No. 508, I may mention that the cooling apparatus there alluded to was tried for the second time during October, and that the mechanical arrangements are reported to have worked satisfactorily in every way. Owing, however, to the hotness of the season, and to the amount of moisture with which the atmosphere was saturated, it was impossible to judge of the cooling powers possessed by the apparatus; and I am afraid that there will be no opportunity to make a satisfactory trial of either apparatus for some months.

From J. W. MELLIS, Esq., for Acting Agent and Manager of the Madras Railway Company, to Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, dated Madras, 21st November 1873, No. 966.

In accordance with the request contained in your letter, No. 1,092, of the 14th instant, I have the honour to forward, herewith, for submission to Government, copy of drawings and description of Mr. Stoney's improved cooling apparatus.

Description of an improved apparatus for cooling Railway carriages, designed to work with a carriage running either way.

DRAWING No. 1.

Fig. No. 1.—The right half shows a plan over the carriage floor, while the left half shows part plan below the floor.

Fig. No. 2.—Is a longitudinal section on line A B.

Fig. No. 3.—Shows a side elevation of the apparatus.

Fig. No. 4.—Shows half end elevation from the right hand end B looking towards the left hand A, as also a half cross section on the line C D.

Fig. No. 5.—Is a horizontal section on line E F showing mode of fixing boards to axle, etc.

Fig. No. 6.—Shows a plan of the water reservoir with its wave breaking partitions.

Fig. No. 7.—Plan of the underside of boards fixed to axle.

The apparatus consists of a perforated zinc "cooling cylinder A," which is enclosed in a rectangular chamber, the lower portion of which forms a water tank, in which the perforated cylinder dips and becomes wet as it revolves.

The rectangular chamber has two funnel-shaped mouths for collecting the current of air produced by the motion of the carriage, and directing the same into the "cooling cylinder."

The entrances to the rectangular chamber can be closed by doors, $d d'$, which revolve on bars worked by cranks, $k k'$, connected by rods $h h'$ to the hand lever $g g'$. These are so arranged that one door shall be open while the other is shut; the motions of the cranks $k k'$ and doors $d d'$ are shown by dotted lines and arcs.

The "cooling cylinder" revolves on a fixed shaft S , to which boards y are attached by iron rods $x x$, these boards prevent the water in the tank from spilling. These boards have other pieces of boards $a a$ attached to their underside to prevent waves from forming on the surface of the water in the tank, and for a similar purpose the tank is divided into a number of small spaces by partitions $a a$, by this means the waves, which the oscillation and motion of the carriage would produce, are broken up and reduced to a minimum, and the water in the tank prevented from spilling.

A segment of the cooling cylinder is allowed to pass through a slot in the top of the rectangular chamber into the cool-air passage Q , through which it is led into the carriage, as shown by red arrows in the drawings.

c is a cam placed on the carriage axle, which, as it revolves, causes the rocking lever e to oscillate; r is a cam rod which conveys the motion of l to the rocker v , to which is attached the friction paul m , by means of which the grooved wheel u receives an intermittent circular motion.

The wheel W is keyed to a hollow shaft S' , which is fixed to the end of the "cooling cylinder" A ; this hollow shaft S' revolves on fixed shaft S , and causes the "cooling cylinder" to revolve intermittently, as driven by the cam c .

The rocker l is provided with holes 1, 2, 3, so that the speed of the cooling cylinder may be varied, that lever with its cam roller t is kept pressed against the cam c by a spring u .

The hand lever $g g'$ is for opening and closing the doors $d d'$, to suit the direction of motion of the carriage, it is shown in full lines in position with the carriage running from left to right; the dotted lines show the respective positions of lever $g g'$, cranks $k k'$, and doors $d d'$, when the carriage moves in the opposite direction.

The red arrows show how the air passes in through the right side of the cooling cylinder, and up through the top segment into the cool air passage q , and thence through the cool air shaft placed under the carriage seat into the carriage.

The lever o is for stopping or starting the apparatus; it works a small door f , by means of a rod e , and raises the lever l , off the cam c , by means of a chain z when pressed down.

The air passage can be closed by the door f , and the cool air thus prevented from entering the carriage if the occupants wish.

The tank can be filled through a funnel, and emptied and washed out through a mud cock placed in its bottom, both shown in the drawings.

The action of the apparatus is as follows:—

The various parts being in the position shown, and the carriage supposed to be running from left to right, air will be forced into the cooling cylinder A , the door d being closed it can only escape through the top of the cooling cylinder into the air passage Q , along which it passes thence up the air shaft into the carriage.

The "cooling cylinder" is made to revolve slowly by means of the cam c , rods r and v , paul m and wheel w ; and as it revolves with its lower segment in water, the perforations of the zinc forming its surface get covered by a film of water. The air in blowing through evaporates this film, and thus becomes cool. Any dust in this air adheres to the damp surface of the cylinder, from which it is washed off while passing through the water below. This dust collects in the bottom of the tank, and can be removed at the end of a journey by flushing through the mud cock.

If the carriage is required to run from left to right, the lever $g g'$ is pressed into the position shown by dotted lines, the door d being then open and d' closed, air will be forced through the left side of the "cooling cylinder," passing out as before through its top segment into the air passage above and thence to the carriage.

If it be desired to stop the apparatus from working, the lever o has only to be pressed down, by which the door f closes the cool air passage, and thus stops any more cool air from entering the carriage, while, at the same time, a small chain Z attached to an arm of the rocking lever l , lifts it, and its cam roller t clear of the cam, and thus stops the entire apparatus from working.

It will be seen, therefore, that the entire working of the apparatus is under the complete control of the inmates of the carriage cooled.

The following are some of the merits claimed for this apparatus:—

1st.—It will work equally well with the carriage running either way.

2nd.—The apparatus is so designed that one cooling cylinder tank, etc., is made to receive and cool air delivered from either side.

3rd.—The whole is made of cheap and durable material, the cooling cylinder being metallic there will be no smell.

4th.—There will be no risk of sparks from the engine setting the cooler on fire when not in use, as it is made of perforated zinc, while this risk exists when the cooler is made of cuscus tatty or other inflammable substance, and this gets dry when the apparatus is stopped.

5th.—The cool air will be free of dust which will be caught on the revolving cylinder, and washed off as it passes through the water contained in the tank.

6th.—The apparatus can be easily and cheaply made, as there will be little fitting or turning, and the materials used not expensive, and when made will be very durable and not likely to get out of order.

DRAWING No. 1-A

Is a design for a cooler similar in principle to that already described, but suited only to work the carriage running one way.

This allows of a simpler apparatus, but it is believed that the gain in having an apparatus to work either way is worth the additional work of the design in drawing No. 1.

In drawing No. 1-A, the air is made to pass right through both sides of the cooling cylinder, and thence into the carriage.

The apparatus can be stopped by pushing down the lever h , which closes the door d , and at the same time raises the rocking lever L and cam roller M off the cam c , as shown in the elevation fig. 1, thus stopping the "cooling cylinder" from revolving, and preventing air from getting to it.

The various parts are clearly shown in the drawing, and, being similar in design to those already described in drawing No. 1, will, it is hoped, be understood without further description.

It will be desirable to make the water-tank of wrought iron instead of wood lined with zinc, as shown in the drawings.

20th October 1873.

(Signed) E. W. STONEY.

No. 256.

ORDER THEREON, 20th January 1874, No. 129.

RAILWAY, No. 35

With the letter above recorded the Consulting Engineer for Railways submits drawings and a descriptive

report of Mr. Stoney's improved and modified apparatus for cooling railway carriages during the hot season; and as Mr. Stoney is anxious that the description of his machine should not be made public, His Excellency the Governor in Council will refrain from communicating it to the Government of India until it shall have been tried and reported on.

Proceedings of the Madras Government, Public Works Department,
20th January 1874.

2. His Excellency in Council hopes that arrangements for practically testing the efficiency of the invention will be made in time to admit of its being greatly utilized next hot season if found to be successful, and that an early report of the results of the experiment will be submitted.

(True Extract.)

Colonel, R.E.,

Secretary to Government.

To the Consulting Engineer for Railways.

Railway Department.

CONSULTING ENGINEER'S OFFICE.

No. 663

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

To

Colonel G. W. WALKER, R.E.,

Secretary to Government,

Public Works Department,

Fort Saint George.

SIR,
Adverting to the minutes of the meeting of the Madras Railway Committee, submitted to Government with No 608 dated the 14th November 1873, I have the honour to enclose, for the information of His Excellency in Council, a letter from the agent of the Madras Railway Company, accompanied by two drawings and a descriptive report from

*No 966
21 Nov 73

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Mr. Stoney of his improved and modified cooling apparatus. Mr. Stoney particularly requests that the description of his apparatus may not be made public for the present.

2. I understand that Mr. Stoney estimates the cost of the modified apparatus, including royalty, at about Rs 260; the cost of the apparatus as originally designed being estimated at about Rs 350.

~~From which~~ With reference to my letter dated the 22 September 1843, No. 28, I may mention that the cooling apparatus there alluded

alluded to was tried for the second time during October, and that the mechanical arrangements are reported to have worked satisfactorily in every way. Owing however to the lateness of the season, and to the amount of moisture with which the atmosphere was saturated, it was impossible to judge of the cooling powers possessed by the apparatus; and I am afraid that there will be no opportunity to make a satisfactory trial of either apparatus for some months.

I have the honor to be
Sir

Your most obedient servant.
Wm. Stewart Esq. L.R.E.
Cons Engineer for Railways

Madras
1 December 1843

[Faint, mostly illegible handwritten text in the left margin, possibly bleed-through from the reverse side.]

[Handwritten notes and signatures in the bottom left corner.]
 No. 129-20
 11/29-20
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To
 The Consulting Engineer
 for Railways,
 The Secretary to Government,
 P. W. Department,
 Fort Saint George.

Dated 11/29 December 1873.
 Recd. 21

[Handwritten signatures and stamps in the bottom right corner.]
 P. W. 1873
 11/29-20
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 11/29-20

No. 966

MADRAS RAILWAY.

AGENT AND MANAGERS' OFFICE.

Madras, 21st November 1873.

From

The Acting Agent and Manager of the M. R. Company

To

Lieut. Colonel J. H. Mc Shaw Stewart R.E.
 Consulting Engineer for Railways.

Sir,

In accordance with the request contained in your letter No 1092 of the 14th instant I have the honour to forward herewith for submission to Government copy of drawings and description of Mr. Storey's improved cooling apparatus.

Have the honour to be,
 Sir

Your most obedient servant

J. H. Mc Shaw
 for the Ag. Agent Manager

Description of an improved apparatus for cooling
Railway passengers. Designed to work with a carriage
running either way.

Drawing No 1

Fig. 1. - The right half shows a Plan over the carriage
floor, while the left half shows part Plan below
the floor.

Fig. 2. - Is a Longitudinal section on line A B

Fig. 3. - Shows a side elevation of the Apparatus

Fig. 4. - Shows half end elevation from the right hand
end B looking towards the left hand A, as also
a half cross section on the line C D.

Fig. 5. - Is a horizontal section on line E F showing
mode of fixing boxes to axle &c

Fig. 6. - Shows a Plan of the water reservoir with its
wave breaking partitions

Fig. 7. - Plan of the under side of Brass fixed to axle

The apparatus consists of a Perforated
Cooling cylinder A which is enclosed in a rectangular
chamber the lower portion of which forms a water
tank in which the Perforated cylinder dips, and
becomes wet as it revolves.

The rectangular chamber has two funnel shaped
mouths for collecting the current of air produced by
the motion of the carriage, and directing the same
into the Cooling cylinder.

The entrances to the rectangular chamber
can be closed by doors d-d', which revolve on
bars worked by crank, H, H', connected by rods
n, n', to the hand lever g-g'. There are so arranged
that one door shall be open while the other is shut
the motions of the cranks H, H', and doors d, d', are

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MADRAS RAILWAY.

From

The Agent and Manager.

To

The Consulting Engineer.

for Railways.

Dated 21 March 1873
Recd. 22.

No. 966

Forwarding as requested
and copy of drawings
& description of the
Stoneys improved
Cooling apparatus

R.M. 652273

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shown by dotted lines and arcs.

The Cooling cylinder revolves on a fixed shaft S, to which boards V are attached by iron rods X, X. These boards prevent the water in the Tank from spilling. These boards have other pieces of board A, A, attached to their under side to prevent waves from forming on the surface of the water in the Tank, and for a similar purpose the Tank is divided into a number of small spaces by partitions, A, A, by this means the waves which the oscillation and motion of the carriage would produce are broken up and reduced to a minimum, and the water in the Tank prevented from spilling.

A segment of the forcing cylinder is allowed to pass through a slot in the top of the rectangular chamber into the cool air passage Q, through which it is lead into the carriage as shown by red arrows in the Drawings.

C is a cam placed on the carriage axle, which as it revolves, causes the rocking lever L to oscillate, R is a cam rod which converts the motion of L, to the rocker V, to which is attached the friction pawl M, by means of which the grooved wheel W, receives an intermittent circular motion.

The wheel W is keyed to a hollow shaft S', which is fixed to the end of the forcing cylinder A, this hollow shaft S' revolves on the fixed shaft S, and causes the Cooling cylinder to revolve intermittently, as driven by the Cam C.

The rocker L is provided with holes 1, 2, 3 so that the speed of the cooling cylinder may be varied, that lever with its cam roller is kept pressed against the cam C by a spring W.

The hand lever G, G' is for opening and closing the doors d, d', to suit the direction of motion of the carriage, it is shown in full line in position with the carriage running from left to right, the dotted lines show the respective positions of lever G, G' cranks H, H', and doors d, d', when the carriage moves in the opposite direction.

The red arrows show how the air passes in through the right side of the Cooling cylinder, and up through the top segment into the cool air passage Q, and thence through the cool air shaft placed under the carriage seat into the carriage.

The lever O is for stopping or starting the apparatus, it works a small door T, by means of a rod U, and raises the lever L, off the cam C, by means of a chain Z, when pressed down.

The air passage can be closed by the door F and the cool air thus prevented from entering the carriage, if the occupants wish.

The Tank can be filled, through a funnel, and emptied and washed out through a mud cock placed in its bottom both shown in the drawings.

The action of the apparatus is as follows: The various parts being in the position shown, and the carriage approach to be running from left to right, the door air with the forced into the forcing cylinder A, the door d, being closed it can only escape through the top of the Cooling cylinder into the air passage Q, along which it passes thence up the air shaft into the carriage.

The Cooling cylinder is made to revolve slowly by means of the cam C, pawl M and wheel W, and as it revolves with its lower

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separate in water, the perforations of the zinc forming
the surface get covered by a film of water. The air in
blowing through evaporates this film, and thus becomes
cool. Any dust in the air adheres to the damp surface
of the cylinder, from which it is washed off while
passing through the water below. This dust collects
in the bottom of the tank, and can be removed
at the end of a journey by flushing through the
mud cock.

If the carriage is required to run from left
to right the lever *g, g*, is pressed into the position
shown by dotted lines, the door *d* being then open
and it closed, air will be forced through the left
side of the "Cooling Cylinder", passing out as before
through its top segment into the air passage above
and thence to the carriage.

If it be desired to stop the apparatus
from working, the lever *o* has only to be pressed
down, by which the door *f* closes the cool air
passage, and thus stops any more cool air from
entering the carriage while at the same time
a small chain is attached to an arm of the rocking
lever *l*, lifts it, and its cam roller to clear of the
cam, and thus stops the entire apparatus from working.

It will be seen therefore that the entire working
of the apparatus is under the complete control of the
inmate of the carriage cooled.

The following are some of the merits claimed
for the apparatus.

1st It will work equally well with the carriage
running either way.

2nd The apparatus is so designed that one cooling
cylinder *Sunk 1st* is made to receive and cool air

delivered from either side.

3rd The whole is made of cheap and durable
material, the cooling cylinder being metallic there
will be no smell.

4th There will be no risk of sparks from the
engine setting the cooler on fire when not used, as it
is made of Perforated Zinc while this risk exists
when the cooler is made of Cane or Lath, or other
inflammable substance, and this gets dry when
the apparatus is stopped.

5th The cool air will be free of dust which will
be caught on the revolving cylinder, and washed
off as it passes through the water contained in the
tank.

6th The apparatus can be easily and cheaply made,
as there will be little fitting or turning, and the materials
used not expensive, and when made will be very
durable & not likely to get out of order.

Drawing No. 1 A

Is a design for a cooler similar in principle
to that already described but suited only to work with
the carriage running one way.

This allows of a simpler apparatus but it is
believed that the gain in having an apparatus to
work either way is worth the additional work of
the design in drawing No. 1.

In drawing No. 1 A the air is made to pass
right through both sides of the cooling cylinder, and
thence into the carriage.

The apparatus can be stopped by pushing
down the lever *N*, which closes the door *d*, and at the
same time raises the rocking lever *I*, and cam
roller *M*, off the cam *C*, as shown in the elevation.

Fig. 1 thus stopping the cooling cylinder from revolving, and preventing air from getting to it.

The various parts are clearly shown in the drawing and being similar in design to those already described in Drawing No. 1 will not be repeated by repetition without further description.

It will be desirable to make the water tank of wrought iron instead of wood lined with zinc as shown in the drawings.

Respectfully,
J. H. Stoney

29th October 1873

(True Copy)

J. H. Stoney
Atty. Chief Eng.

No 129 P. W. Dept
Proceedings of the Madras Government

Read the following

From The Chief Engr (H. C. No 643 of 1st Dec 1873)
for Railway

With the letter
above recorded the
Consulting Engineer for
Railway submits —
drawings and a descriptive
report of Mr. Stoney's
improved and modified
apparatus for cooling
Railway carriages during
the hot season; and as
Mr. Stoney is anxious
that the description
of his machine should
not be made public
His Excellency the Governor
in Council will refrain
from

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P. W. Dept
No 129 - 20-1-74

from communicating
to the Government of
India until it shall
be tried and reported
on.

This Excellency in
Council hopes that ar-
rangements for practi-
cally testing the efficiency
the invention will be
made in time to do
of its being greatly at-
tended next season if
found to be successful
and that an early
report of the results
the experiment will
be submitted.

[Faint handwritten notes, possibly "G.M.S." and other illegible text]

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Govt. of 1873 Madras.
PUBLIC WORKS.

To the Consulting Eng^r
for Railways

Dated _____
Recd. _____ Encl. 4
G. O. 20th Sept 1873 No. 129

No. 2551256

Mr. Stoney's improved and
modified apparatus for
cooling Railway Carriages.

Paying orders on letter from
the (one) Eng^r submitting
drawings & descriptive
report of the apparatus.