



GEORGE HAWXHURST, OF SOMERSVILLE, CALIFORNIA.

Letters Patent No. 84,489, dated December 1, 1868.

IMPROVED MODE OF PREVENTING CORROSION OF BOILER-TUBES IN SEA-GOING VESSELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GEORGE HAWXHURST, of Somersville, county of Contra Costa, State of California, have invented a new and improved Mode of Preventing the Destruction of Boiler-Tubes in Sea-Going Vessels; and I do hereby declare that the following specification gives a full, clear, and exact description of the operations to be performed, together with the agents used in performing the said operations, or accomplishing the said object.

The nature of my invention is to provide a new mode of preventing the rapid destruction of the tubes of boilers of sea-going steamers using surface-condensers, and from some cause, not well understood, there arises a very rapid corrosion and destruction of the tubes, which must be frequently replaced at great expense.

It is a well-known fact that surface-condensation, as now practised, has the great disadvantage of being accompanied with more or less corrosion or waste of the boilers, and particularly of the tubes, and as tubular boilers have become almost indispensable in sea-going steamers, it is a matter of great importance to obviate this source of trouble and expense.

The cause of this particular corrosion is involved in mystery; and indeed the corrosion of iron in all other forms, and under varied circumstances, has been the subject of much thought and research among scientific men, and without unanimity of opinion.

It is therefore superfluous to describe herein the various theories presented, inasmuch as the object of the invention is simply to produce the practical result of obviating the practical difficulty, and, in this connection, has more reference to the daily duties of the engineer than to the province of analytical chemistry.

In my invention, the desired result is accomplished by introducing into the boiler a solution of lime in water, commonly known as lime-water.

This material may be introduced at intervals, as required, or it may be continuously, in small quantity,

by mechanism provided for that purpose, but it is perhaps preferable to use a globe-cock similar to the common globe talon-cock used on steam-engines.

The quantity of lime used to make the solution is of course to be determined by the amount of condensed water that is derived from the condenser, and pumped into the boiler.

A consumption of one pound of lime per day of twenty-four hours, for each one hundred and fifty (150) horse-power developed in usual practice, will be a fair criterion for the engineer to gauge the quantity to use, taking care rather to use too much than too little, as, in the case of using in excess, the result of the production of a thin scale on the tube is not objectionable.

In fact it has been common heretofore to endeavor to form a similar scale, by pumping salt water into the boilers, thereby protecting the tubes to a considerable extent, but at a great expense in fuel, and with uncertain results.

But referring again to the undetermined causes of corrosion, it would seem that this new invention operates as an actual neutralizing-agent to that principle in the condensed water which causes the corrosion, as well as by forming a protecting scale precipitated on the surface of the tubes.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

A protection from corrosion, for the boilers of steamers using surface-condensers, consisting of the solution herein described, and used substantially as set forth.

In witness whereof, I have hereunto set my hand and seal.

GEORGE HAWXHURST. [L. s.]

Witnesses:

DAVID STODDART,
J. L. BOONE.