

UNITED STATES PATENT OFFICE.

JOHN COCHRANE, OF NEW YORK, N. Y.

IMPROVEMENT IN PREVENTING CORROSION OF STAY-BOLTS IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **136,213**, dated February 25, 1873.

To all whom it may concern:

Be it known that I, JOHN COCHRANE, of the city and county of New York and State of New York, have invented a new and useful Method of Preventing, by chemical or other means, the Corrosion of the Stay-Bolts in Steam-Boilers; and I do hereby declare that the following is a full and exact description thereof.

The stay-bolts which are used for securing or fastening the flat portions or water-tables of steam-boilers are found to corrode rapidly from the action of the acids and salts that are held in solution by the water within the boiler, while the plate-iron of which such boilers are made is for the most part but little affected by such chemical action, as the plates are hardened at the surface by the compressing action of the rolls in process of making them; and having discovered that the comparatively inferior ability of the stay-bolt to resist corrosion arises from the fact that the original surface or outer crust of the bolt is entirely removed by the cutting-dies in forming the screw-threads thereon, thus depriving the bolt of its protecting-surface and leaving it pervious to the corroding action of the acids and salts of the water within the boiler, by which it is rapidly deteriorated as compared with the boiler-plates, which usually outlast three sets of stay-bolts, the object of my invention is to overcome this defect in the stay-bolt, and to make it as

durable as the plate-iron of the boiler, and this I accomplish by artificially hardening its exterior portion or surface, which may be done by inclosing the bolts in an iron box with a packing of animal charcoal and submitting them to a red heat in the chamber of a furnace for about five hours, more or less, and then plunging them into cold water; or the bolts may be heated to redness in a clean fire and then rubbed with prussiate or bichromate of potash, which will melt and flow over the hot surface, when the bolt should be immediately plunged into cold water; or the proposed result may be accomplished by forming the screw-thread upon the bolt by compression, while red hot, between suitably-formed dies, as described in Letters Patent granted to me April 2, 1867, thereby retaining the original crust or protecting-surface of the iron, as in the boiler-plates.

Having thus described my invention and some of the means by which it may be made available in practice, what I claim is—

A stay-bolt rendered impervious to the action of the acids and salts usually present in the water of steam-boilers, in the manner and for the purpose substantially as described.

JOHN COCHRANE.

Witnesses:

HAL ALLAIRE,
A. B. MALCOMSON, Jr.