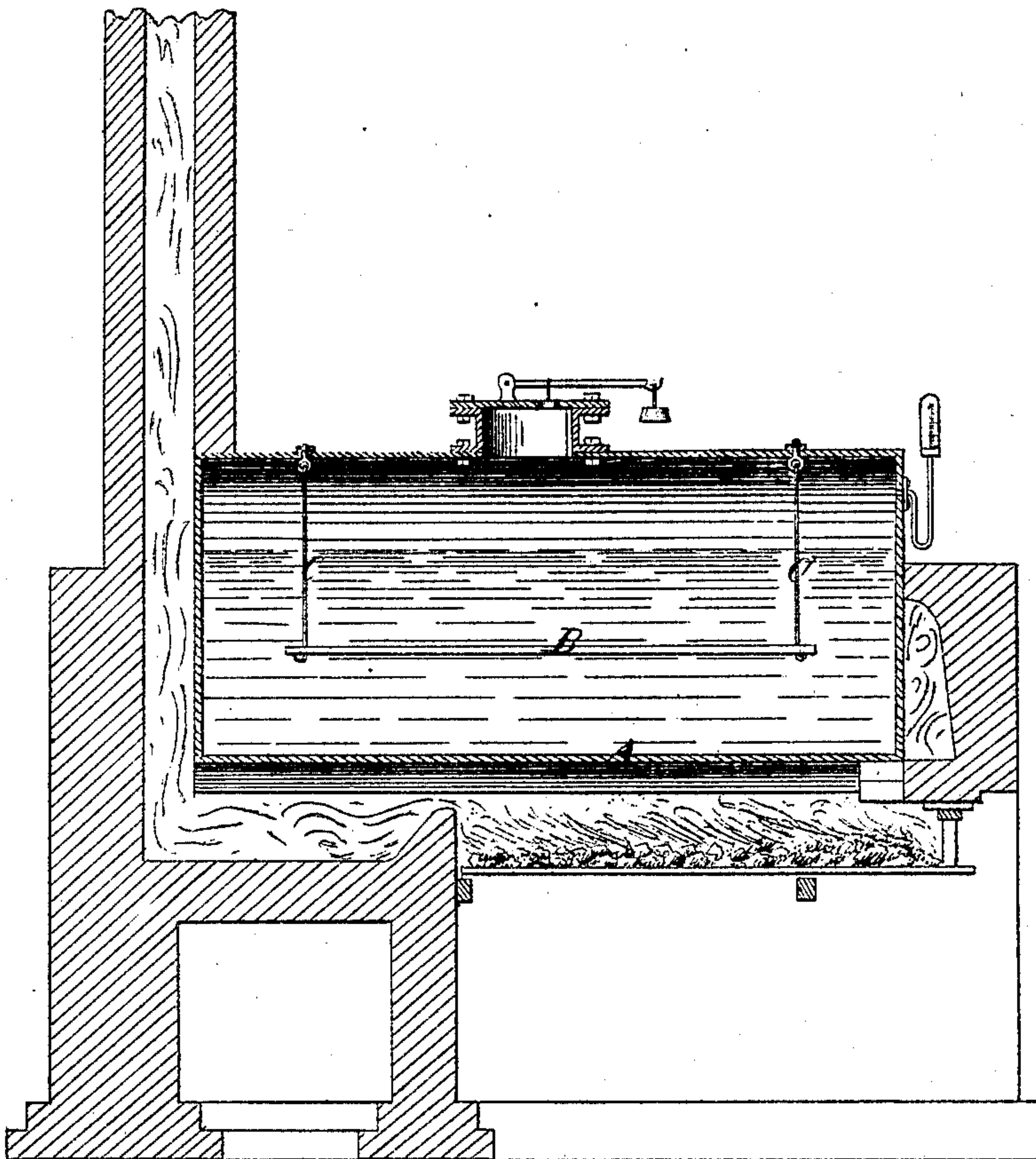


N. B. WEBSTER & R. W. YOUNG.  
PREVENTING INCRUSTATION IN STEAM BOILERS.

No. 30,511.

Patented Oct. 23, 1860.



Witnesses, as to Webster

*J. K. Purdy*  
*A. S. Maguire*  
Witnesses as to Young { *George Bartle*  
*John P. Polk*

*N. B. Webster*

*R. W. Young*

# UNITED STATES PATENT OFFICE.

N. B. WEBSTER AND R. W. YOUNG, OF PORTSMOUTH, VIRGINIA.

## IMPROVEMENT IN PREVENTION OF INCRUSTATION OF STEAM-BOILERS.

Specification forming part of Letters Patent No. 30,511, dated October 23, 1860.

*To all whom it may concern:*

Be it known that we, NATHAN B. WEBSTER and ROBERT W. YOUNG, of Portsmouth, in the county of Norfolk and State of Virginia, have invented a new mode of preventing the deposit of scale or incrustation on the internal surfaces of steam-boilers; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, making part of this specification.

The nature of our invention consists in inserting within the steam-boilers, in such positions as the structure of the boilers may require, rods, sheets, or other forms of some metal, which, compared with the metal of the boilers, shall be electro-negative, on which electro-negative metal, instead of on the boiler-surfaces as at present, the material of the scale or incrustation will be deposited in accordance with the laws of electrolysis and electro-metallurgy.

It being an established principle in electro-chemistry that when two metals stand to each other in the relation of anode and cathode, in contact with an electrolyte holding in solution any salt, electrolysis is the result, and the base of the salt is deposited upon the cathode. As an example, to illustrate more clearly this principle, we would refer to the process of electro-gilding. Sea and river waters contain in solution a salt or salts, as indicated by their analyses, and hence are electrolytes. We therefore insert within the boiler rods, sheets, or other forms of some metal electro-negative to the metal of the boiler, which electro-negative metal thereby becomes a cathode, the boiler itself being the anode; consequently, in accordance with the above-stated principle, the base of the salt, which is also the base of the scale or incrustation, is deposited on the cathode, or rods, sheets, or other forms of electro-negative metal inserted therein.

In the accompanying drawing, our invention is illustrated by a vertical longitudinal section of a steam-boiler of common form, A representing the shell of the boiler; and B a plate of metal, electro-negative thereto, suspended within it beneath the water-level in such a manner as to avoid direct contact between the plate and the shell, but afford metallic communication from one to the other by means of the suspending-wires C, in order that the electric current may pass through the water from the shell to the suspended plate. In the case of an iron boiler copper may be instanced as a suitable metal for the plate B. Its area may be about two square inches to a square foot of iron, or in such other proportion as experience may dictate, the relative area being somewhat varied, however, with the degree of saturation allowed. For a copper boiler the plate B may be of platinum.

We do not desire to be understood as confining ourselves to any specific metals, or to any particular construction or arrangement of boiler, as it is evident that the invention is equally applicable to steam-boilers of all descriptions; neither do we confine ourselves to any specific manner of connecting the negative metal with the surface or material of the boiler.

We claim as new and of our invention herein, and desire to secure by Letters Patent—

Connecting with the interior of a steam-boiler a metal electro-negative to the metal of the boiler, substantially as and for the purpose set forth.

NATHAN B. WEBSTER.  
R. W. YOUNG.

Witnesses:

WLS. H. WOODLEY,  
ANDREW JACKSON DOW.