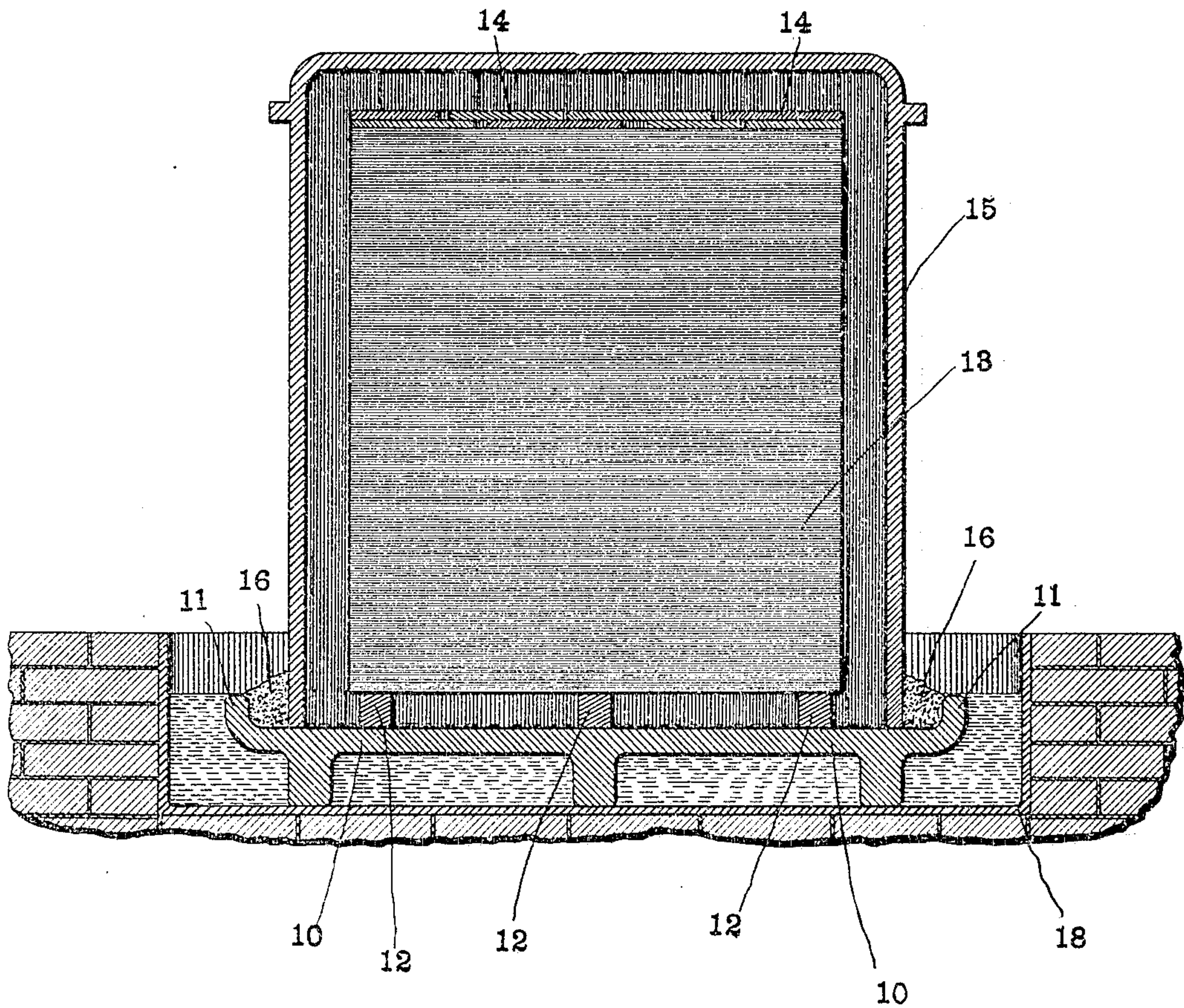


No. 788,167.

PATENTED APR. 25, 1905.

T. O'BRIEN & W. P. LONG.
PROCESS OF COLORING STEEL OR IRON PLATE.

APPLICATION FILED SEPT. 17, 1904.



Witnesses
J. A. Miner
J. A. Walsh

Inventors
Thomas O'Brien
William P. Long
By *Bradford Hood*
Attorney

UNITED STATES PATENT OFFICE.

THOMAS O'BRIEN AND WILLIAM P. LONG, OF ELWOOD, INDIANA, ASSIGNORS TO AMERICAN SHEET AND TIN PLATE COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

PROCESS OF COLORING STEEL OR IRON PLATE.

SPECIFICATION forming part of Letters Patent No. 788,167, dated April 25, 1905.

Application filed September 17, 1904. Serial No. 224,932.

To all whom it may concern:

Be it known that we, THOMAS O'BRIEN and WILLIAM P. LONG, citizens of the United States, residing at Elwood, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Processes of Coloring Steel or Iron Plates, of which the following is a specification.

Heretofore there has been used a process for bluing metal plates in which the plates after having been first piled edgewise in an annealing-box and then heated are withdrawn from the furnace and subjected to the action of superheated steam introduced into the box while the plates are still hot. In carrying out this process it is essential that the annealing-box be provided with means by which attachment may be made to the supply of superheated steam, and considerable difficulty is experienced in making such connections. The apparatus required is also expensive, because of the need of means for superheating the steam. The process is also very expensive, because of the necessity of stacking the plates on edge. This stacking of the plates on edge very largely decreases the necessary furnace capacity of the plant, because of the increased amount of room required for a given number of sheets during treatment.

The object of our present invention is to provide a process for coloring metal plates, in which the plates may be stacked horizontally in the usual manner in ordinary annealing-boxes and may be subjected to the action of a small quantity of water allowed to enter the annealing-box while the plates are hot.

The accompanying drawing illustrates a means by which our invention may be carried out, said drawing being a vertical section of a suitable annealing-box and a shallow immersing-pit.

In the drawing, 10 indicates the base of an ordinary or any desired form of annealing-box. This base is of a shallow saucer shape, having the short vertical edge flange 11, and is provided with the usual supporting-feet. In carrying out our process we lay in the bottom of this pan cross-strips 12, and we place

upon these cross-strips the stack of sheets 13, the top sheet of the stack being preferably protected by thicker plates 14, laid loosely thereon in the usual manner. A cover or box 15 of the usual or desired form is then placed over the stack in the usual manner and sealed by a suitable packing, as sand 16, in the usual way. The box thus loaded is run into the annealing-furnace and subjected to a desired and usual annealing temperature for the proper length of time in the usual manner to thoroughly anneal the plates. The heated box, with its contents, is then withdrawn and allowed to stand on the annealing-floor about five hours. The whole is then set and allowed to stand about one hour in a shallow tank 18, in which there is sufficient water to come over the flange 11, so that the water seeps through the sand 16 and passes into the interior of box 15. The parts are then moved from the tank and allowed to stand several hours, generally about twelve, until well cooled. The top is then withdrawn from over the stack of plates, when it will be found that the vapor from the water has thoroughly permeated between all of the sheets of the stack and both sides of each plate have been given a dark blue--almost a black color.

Repeated experiments have shown that the plates 13 may be arranged in stacks several feet high in the ordinary manner, yet the coloring of the lower sheets of the stack will be nearly as perfect as the coloring of the upper sheets and will be uniform over every sheet.

We claim as our invention—

1. That method of coloring metal sheets, which consists in heating the same in a closed receptacle, reducing the temperature of the receptacle and sheets, and thereafter introducing an oxidizing liquid into the receptacle while the plates are hot and the cover remains over the sheets.

2. That method of coloring metal sheets, which consists in inclosing the same in a closed box, sealing with a permeable seal, subjecting the box and plates to a high degree of heat,

withdrawing the heated box and its contents and placing the same in a shallow tank of an oxidizing liquid whereby the liquid may percolate into the bottom of the interior of the box
5 while the plates are in a heated condition.

3. That method of coloring metal sheets, which consists in stacking the same horizontally in a shallow pan, covering with an inverted box-cover, heating, and then inserting
10 water into the pan and interior of the cover while the plates are hot and the cover remains over the sheets.

4. That method of coloring metal sheets, which consists in heating the same in a closed
15 receptacle and thereafter introducing water into the receptacle while the plates are hot and the cover remains over the sheets.

5. That method of coloring metal sheets, which consists in inclosing the same in a closed

box, sealing with a permeable seal, subjecting 20 the box and plates to a high degree of heat, withdrawing the heated box and its contents and allowing the same to stand until partially cool, placing the box with its contents in a shallow tank of water and allowing the same 25 to stand therein and the water to enter the box, removing said tank and contents from said basin and allowing the same to stand until sufficiently cool to handle before opening.

In witness whereof we have hereunto set our 30 hands and seals, at Elwood, Indiana, this 12th day of September, A. D. 1904.

THOMAS O'BRIEN. [L. S.]
WILLIAM P. LONG. [L. S.]

Witnesses:

C. W. BENNETT,
J. H. FINE.