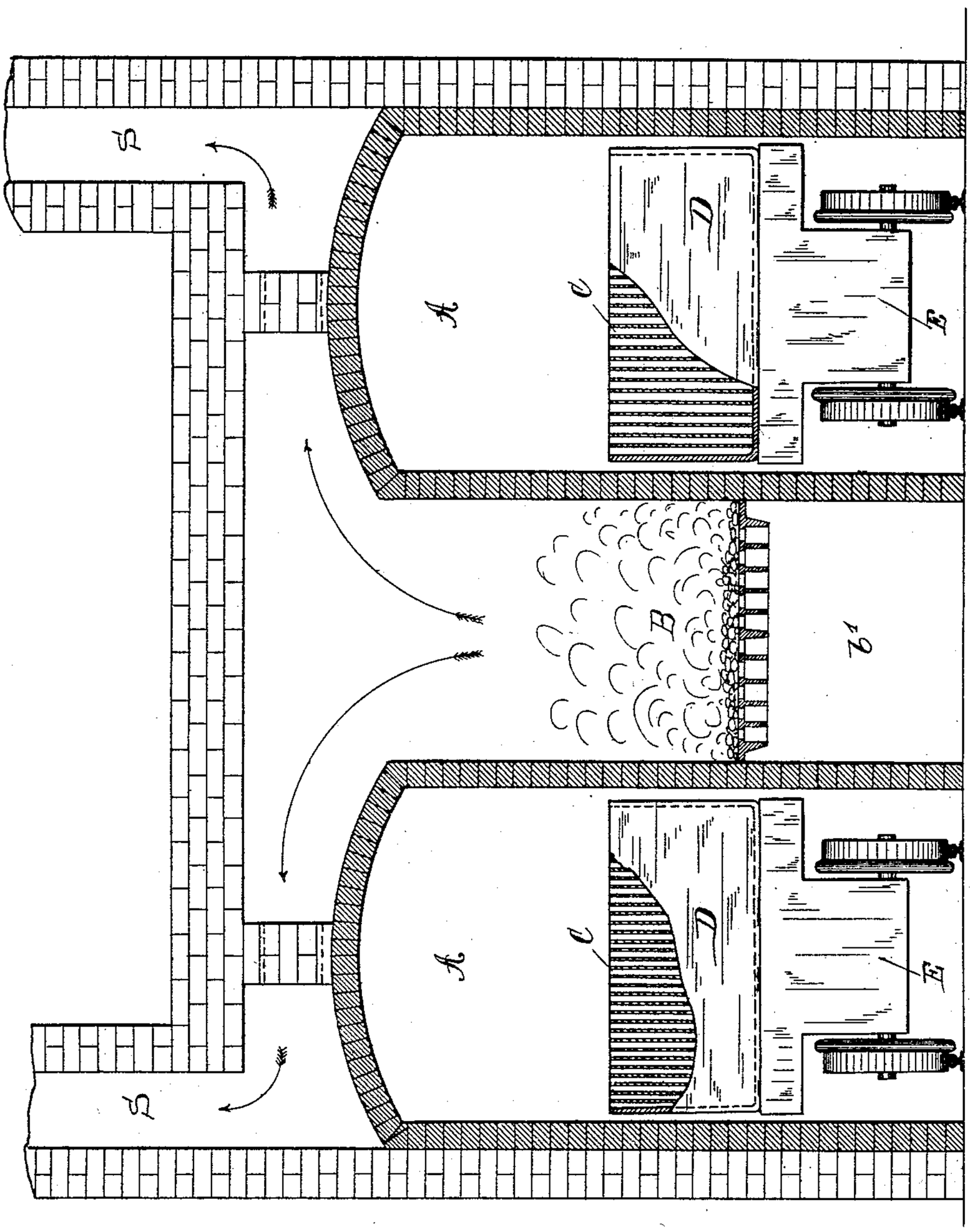
No. 713,440. Patented Nov. 11, 1902.

J. HOWELL & S. J. DREW.

PROCESS OF TREATING METAL PLATE.

(Application filed July 27, 1901.)

(No Model.)



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JENKIN HOWELL AND SAMUEL J. DREW, OF JOLIET, ILLINOIS.

PROCESS OF TREATING METAL PLATE.

SPECIFICATION forming part of Letters Patent No. 713,440, dated November 11, 1902.

Application filed July 27, 1901. Serial No. 69,979. (No specimens.)

To all whom it may concern:

Be it known that we, JENKIN HOWELL and SAMUEL J. DREW, citizens of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Processes of Treating Metal Plates; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in the process of treating sheet-metal plates in the production of tin-plate. Important results obtained by our improved process are the reduction of the number of times the plates must be handled manually, the saving of time between the pickling and the annealing steps, the thorough cleansing of the plates, whereby the formation of green or other patches in the annealing is prevented, and economy in the treatment as compared with the methods in common use.

In the manufacture of tin-plate as commonly carried on after the plates are removed from the usual pickling-bath they are washed in water or swilled to remove the deposits of the pickling, then placed flatwise or superimposed horizontally in annealing-pots, which are run into reverberatory furnaces, to the flames of which the sides of the pots are subjected until the plates are red-hot, after which they are allowed to cool, when they are ready for the rolls or for further treatment. In so treating the plates they must be separately handled—once when placed in the pickling-bath, a second time when taken out of such bath, and a third time when placed in the annealing-pots. In spite of great care in the washing and annealing of these plates in the manner described foreign substances adhere to the plates from the pickling-bath, which result in the formation of green and other patches during the annealing, with the result that the plates so damaged are rendered entirely unmerchantable or are much reduced in value.

In carrying into effect our process we preferably use a furnace such as is shown in the accompanying drawing, which shows a cross-section of the furnace used for annealing the plates.

Referring to the drawing in detail, A represents the furnace-ovens; B, the fire-box; S, the smoke-stacks; D, the annealing-boxes supported on wheeled trucks E; C, the plates arranged on edge in the boxes, and b' the ash-pit of the furnace.

In the application of our improved process we take the plates after they leave the usual pickling-bath and while set on edge in the annealing-boxes and wash or swill them with a weak solution of hot water and muriatic acid, about one and one-half gallons of acid being used to one hundred gallons of water in the solution. After so swilling the plates we subject them to a final washing of lime-water, in which we use one hundred pounds of lime to one hundred gallons of water. The weak acid-bath removes the deposits left on the plates from the pickling-bath or makes them solvent, so that they may be effectively removed by the bath of lime-water referred to, so that when the plates are ready to go to the annealing-furnace they are clean and sufficiently warm from the hot acid solution and the hot lime-water to almost dry them. The plates are left in the same pots or boxes in which they have been pickled and swilled and in the same position—*i. e.*, on edge and not in contact with each other—and are run into the annealing-furnace, where they are subjected to superheated air, which is permitted to come into direct contact with the faces of the plates by reason of the position and arrangement of the plates described. The dry heat of the furnace-ovens quickly takes up any moisture which may be left on the plates from the baths described and they become quickly and thoroughly heated, thus effecting their annealing in much less time than with the usual methods.

We are aware that it is not new to subject iron plates to a swilling of lime-water, nor is it new to anneal them in ovens as distinguished from reverberatory furnaces, and we therefore do not claim such methods; but

What we claim, and desire to obtain by Letters Patent, is—

1. In the process of treating metal plates in the manufacture of tin-plate, first subjecting the plates to the usual pickling-bath, then washing the plates in a weak solution of muriatic acid and water, then washing the plates

in a solution of lime and water, and then subjecting them to hot air for annealing purposes.

2. In the process of treating metal plates in the manufacture of tin-plate, first subjecting the plates to the usual pickling-bath, then washing same in a weak solution of muriatic acid and hot water, then washing them in a strong solution of lime and water, and finally subjecting said plates to direct contact with hot air on both sides, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JENKIN HOWELL.
SAMUEL J. DREW.

Witnesses:
CHAS. R. BACKUS,
MELVIN RAINVILLE.