

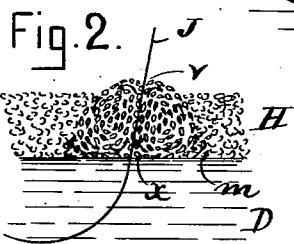
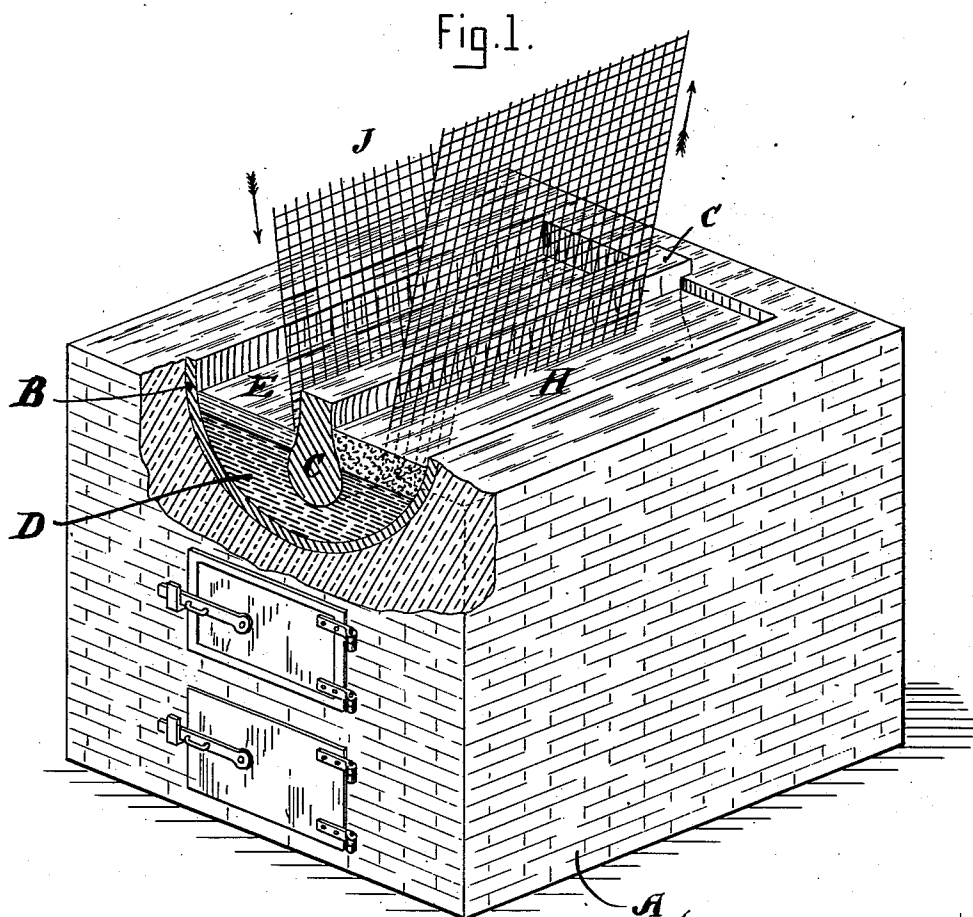
(No Model.)

B. SCARLES.

PROCESS OF GALVANIZING AND TINNING WIRE CLOTH,
WIRE NETTING, &c.

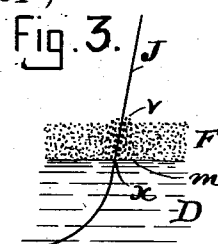
No. 361,550.

Patented Apr. 19, 1887.



Witnesses.

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UNITED STATES PATENT OFFICE.

BENJAMIN SCARLES, OF CLINTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF
TO THE CLINTON WIRE CLOTH COMPANY, OF SAME PLACE.

PROCESS OF GALVANIZING AND TINNING WIRE-CLOTH, WIRE-NETTING, &c.

SPECIFICATION forming part of Letters Patent No. 361,550, dated April 19, 1887.

Application filed October 18, 1886. Serial No. 216,482. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN SCARLES, of Clinton, in the county of Worcester, State of Massachusetts, have invented a certain new and useful Improvement in the Process of Galvanizing and Tinning Wire-Cloth, Wire-Netting, &c., of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an isometrical perspective view illustrating the method of using my improvement, a portion of the furnace and pot being represented as removed, and Figs. 2 and 3 diagrams introduced to exemplify certain details pertaining thereto.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

It is well known that in galvanizing or tinning wire-cloth, wire-netting, &c., by the ordinary process the web is passed into the pot through a flux of sal-ammoniac or similar substance to brighten it or remove the oxide, then through the molten metal constituting the coating material, and finally through a stratum of sand or asbestos, to wipe off or remove the surplus coating material, the flux and sand or asbestos, as the case may be, being placed on the molten metal in the pot, and the flux separated by a partition from the wiping material. The employment of sand has, however, been found to be objectionable for several reasons. Being very heavy, its weight causes the web, more especially in light fabrics having fine meshes, to sag at or near the center, and thus displace the wires of which it is composed, the wires becoming permanently fixed in a wrong position when the galvanizing or tinning material with which they are coated cools. The finer grains or particles of sand are also liable to become embedded in the coating, and thus give it a rough unfinished appearance, and sometimes the grains adhere to each other, thereby forming "slag" or lumps, which act injuriously on the coating,

removing it almost entirely in some places and leaving it too thick in others. Asbestos, being of a fibrous nature, is more objectionable in some respects than sand, as its action is distinctly that of a wiper, thereby destroying the grains or gloss of the coating and leaving it with a comparatively dull and unfinished appearance.

My invention is designed to obviate these difficulties or objections, and to that end I make use of means which will be readily understood by all conversant with such matters by the following explanation:

In the drawings, A represents the furnace, B the pot, and C the guide, these parts being of the ordinary form or construction.

The galvanizing or tinning materials D, of which the coating is composed, are placed in the pot B, being kept in a molten state and at the proper temperature in the usual manner. A flux of sal-ammoniac or other suitable materials, E, is placed on the molten metal D, at one side of the guide C, and a stratum or layer of coke, H, on the opposite side, the flux and coke being of less specific gravity than the metal, and of course floating thereon. The guide C is partially submerged in the metal, and extends above the surface of the same a sufficient distance to subserve as a dam or partition, to keep the coke and flux properly separated.

In carrying out my improvement the web of wire cloth or netting J is drawn by suitable mechanism (not shown) downwardly through the flux E, into the molten metal D, thence beneath the guide C, upwardly through the coke H, being galvanized or tinned on its passage in a manner which will be readily obvious without a more explicit description.

The coke is used as a wiper in place of the sand or asbestos usually employed, and, being of small specific gravity, does not operate to sag the web or displace the wires of which it is composed; neither does it adhere to or become mixed with the coating material on the wires as the web is passed through it, being, on account of its extreme lightness, floated out of or expelled from the same before it cools, and leaving an exceedingly smooth and bril-

liant surface, which I have found it impossible to produce when any other wiper with which I am familiar is employed.

Coke, being a product of mineral or pit coal and devoid of nearly all the elements which would render it readily combustible, retains the heat from the molten metal on which it floats without being consumed thereby, and, being very light, a very thick layer may be employed, thus bringing a greater working-surface, so to speak, in contact with the web than is possible when either sand or asbestos is used.

As the coating on the wires begins to cool or harden at the point where the web leaves the surface of the molten metal and passes upwardly into the wiper, it is important that it should not cool too rapidly or before the surplus coating material has been removed, and hence it is necessary, in order to produce the best result, that the wiper should not only be adapted to be heated readily to the temperature of the molten metal on which it is disposed, but to retain the heat, so that when the web is submitted to it the surplus coating material may be kept in a liquid state long enough to be properly removed.

The advantages of coke over sand in this respect will be apparent by reference to Figs. 2 and 3. In Fig. 2 it will be observed that the layer of coke H presents a very large contact or working surface to the web J, and, as the particles or pieces of which the layer is composed are very light and the layer comparatively thick, the coke is disturbed for a considerable distance at either side of the web as it is drawn upward, thereby enabling the particles which are brought into immediate contact with the web in removing the surplus coating material to be properly reheated before being again brought into service. For instance, the particle *x*, resting on the molten metal, will be of substantially the same temperature, but as it is carried upward by the web will lose a portion of its heat in performing its work, so that when it reaches the point *v* it will be comparatively cool, but it will then be thrown outwardly and fall to the point *m*, from whence it will be carried, as the mass revolves, to the point *x* for further service, being heated on its journey from *m* to *x* to its normal temperature. The operation of the grains of sand, as shown in Fig. 3, is similar to that of the particles of coke; but, as the sand is of greater specific gravity, its grains, after being carried from the bottom to the top of the layer

F by the rising web, fall again into their original position, or nearly so, and hence do not become heated properly in traversing from *m* to *x*, the distance between these two points in Fig. 3 being much less than in Fig. 2.

In galvanizing or tinning wire fabrics in the manner described gases are sometimes generated, which become confined in and beneath the wiping material when sand or asbestos are used for that purpose, and, unless great care is exercised, bubbles will form, which interfere with the proper coating of the wires. The use of coke obviates this difficulty, as it is sufficiently porous to permit the escape of the gases and yet adapted to retain sufficient heat to melt off the surplus coating material.

It will be understood that the coke is broken up into particles or pieces corresponding in size with the character of the work, the pieces being quite small for the finer grades of cloth or netting and larger for the coarser grades.

I do not confine myself to the use of the flux E disposed on the metal D or in any other position, as a flux may be dispensed with when the wires of which the web J is composed are not sufficiently oxidized to prevent the coating material from adhering properly; neither do I confine myself to any special form of guide C, nor to any special means for immersing the web J, nor to the use of the coke in coating wire-cloth and wire-netting only, as it may be employed to good advantage in coating other articles with metal in the manner described; but,

Having thus explained my invention, what I claim is—

1. That improvement in the art of coating or galvanizing metallic articles which consists in subjecting such articles to the action of a molten-metal bath and to the wiping action of floating particles of coke on said bath.

2. In the art of galvanizing or tinning wire-cloth, wire-netting, and other articles, passing the cloth, netting, or articles to be coated through a flux of sal-ammoniac or similar material, then into a mass of molten metal or coating material contained in a suitable pot or vessel, and withdrawing the same through a wiper composed of coke, the flux and wiper being disposed on said molten metal in the pot and separated by a dam or partition, substantially as described.

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Witnesses:

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