No. 656,500. Patented Aug. 21, 1900.

E. I. BRADDOCK.

GALVANIZING APPARATUS.

(Application filed Mar. 24, 1900.)

(No Model.)

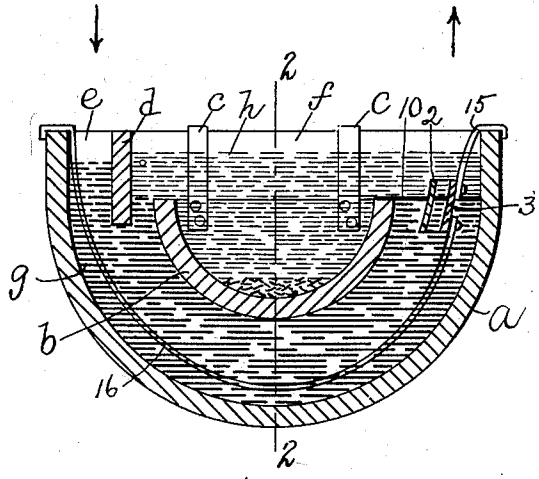


Fig. 1

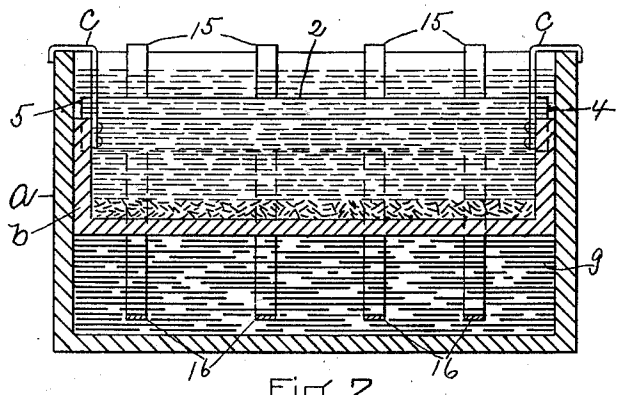


Fig. 2.

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EDWARD I. BRADDOCK, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO THE NEW PROCESS COATING COMPANY, OF PORTLAND, MAINE.

GALVANIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 656,500, dated August 21, 1900.

Application filed March 24, 1900. Serial No. 9,983. (No model.)

To all whom it may concern:

Be it known that I, EDWARD I. BRADDOCK, a citizen of the United States, residing in Winchester, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Galvanizing Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to an apparatus with which iron or steel strips, sheets, wires, &c., may be efficiently and economically galvanized by the method disclosed in United States Patent No. 645,520, granted to me March 13, 1900.

The object of the present invention is to provide apparatus with which the surface area of dross through which the iron or steel strip is passed is restricted and the dross, substantially as fast as formed, is continuously removed during the process of galvanizing from the portion of the surface of contact of the zinc-bath with the lead-bath through which the metal strip is passed. For this purpose I employ an outer kettle or vat, a smaller inner kettle located within the outer kettle below the upper edge thereof, and means within the outer kettle between it and the inner kettle and extended above and below the upper edge of the inner kettle, but below the upper edge of the outer kettle to form a substantially-narrow outlet passage-way for the strip, sheet, &c. The outer kettle is provided with means, such as a partition-wall, which may form part of the inner kettle and which separates the upper portion of the outer kettle into a substantially-narrow entrance-chamber and a substantially-wide chamber, in which latter is placed a bath of zinc or its alloys, which fills the inner kettle and a portion of which rests on a bath of lead in the outer kettle, which latter bath extends up into the entrance-chamber and also up into the narrow outlet passage-way to a point substantially on a level with the upper edge of one side of the inner kettle, the remaining portion of the narrow outlet-passage being filled with the zinc or its alloys floating on the lead. The narrow outlet passage-way referred to is closed at its sides and ends, but is open at its top and bottom, so that the dross formed in said passage-way is continuously removed during the galvanizing process and substantially as fast as formed from the surface of contact of that portion of the galvanizing-bath and of the lead-bath through which the metal strip is passed, and as the portion of the galvanizing-bath within the said outlet passage-way is used up in the process of galvanizing it is continuously replenished from the other portion of the galvanizing-bath outside of said passage-way. The dross in the outlet passage-way is removed by the passage of the metal strip, which creates a current or flow of metal and draws the small amount of dross formed by each metal strip up out of the said passage-way and into the body of the galvanizing-bath outside of said passage-way, in which bath said dross settles and can accumulate in the inner kettle, and that portion of the dross which may accumulate on the lead surface between the inner kettle and the walls of the substantially-narrow passage-way is prevented from flowing back into the said passage-way by its walls, which effectively cut off the zinc in the passage-way from the dross outside thereof.

Figure 1 is a transverse section of an apparatus embodying this invention, and Fig. 2 a longitudinal section of the apparatus shown in Fig. 1 looking toward the right.

Referring to the drawings, the outer kettle *a*, the smaller kettle *b*, suspended therein by the straps or hangers *c*, the partition-wall *d*, separating the upper portion of the kettle *a* into two chambers *e f*, the bath *g*, of lead or its alloys, and the bath *h*, of zinc or its alloys, are and may be the same as shown and described in the patent above referred to.

In practicing the process described in the patent referred to the metal strip, sheet, &c., is passed down through the chamber *e* into the lead-bath *g*, out of which it issues through the portion of the zinc-bath resting on the column of lead between the inner and outer kettles. As the iron or steel strip, sheet, &c., issues from the lead-bath and enters the zinc-bath dross is formed, which, being heavier than the zinc and lighter than the lead, settles between the surface of contact of the

zinc with the lead, and the amount of dross through which the iron or steel strip, sheet, &c., is passed as the process of galvanizing is continued is reduced by overflowing the dross substantially as fast as formed in the inner kettle.

With the apparatus shown in the patent referred to the dross covers the surface of the outlet-column of lead; and the present invention has for its object to provide means whereby the area of dross resting on the lead surface and through which the iron or steel strip, sheet, &c., is passed may be restricted, so that the said metal strip will pass through a substantially small and inappreciable amount of dross. This result may be effected by forming a narrow outlet passage-way from the lead-bath into the zinc-bath, which is closed at its sides and ends and open at its top and bottom and which may be formed, as shown in Figs. 1 and 2, by a box-like structure comprising side walls 2 3 and end walls 4 5, suitably supported within the kettle *a* and between it and the inner kettle *b*, with their upper edges below the upper surface of the zinc or galvanizing bath and their lower edges below the surface of the lead-bath. The walls of the outlet passage-way effectively cut off the dross 10 on the outside of the passage-way and prevent said dross from flowing or running back into said passage-way. In this manner it will be seen that the amount of dross formed in the passage-way referred to is restricted in area and the dross within said passage-way is, by the action of the metal sheet, strip, &c., carried up out therefrom and into the main portion of the zinc-bath, wherein it may settle upon the lead surface outside of the cut-off passage-way, from which it may overflow into the inner kettle *b*, as represented in Fig. 1.

The cut-off box shown in Fig. 1 may be supported within the kettle *a* below the upper surface of the zinc-bath by means of suitable hangers 15 16, which latter may also serve as a run or guide for the metal sheet, strip, &c., as it is passed through the lead-bath.

I claim—

1. An apparatus for galvanizing strips, sheets, &c., comprising an outer kettle, a smaller inner kettle located within the outer kettle below the upper edge thereof, and means within the outer kettle between it and the inner kettle and extended above and below the upper edge of the inner kettle but below the upper edge of the outer kettle to form a substantially-narrow outlet passage-way for the strip, sheet, &c., substantially as described.

2. An apparatus for galvanizing strips, sheets, &c., comprising an outer kettle, a smaller inner kettle located within the outer kettle below the upper edge thereof, and a cut-off box within the outer kettle and below the upper edge thereof and forming an outlet passage-way for the metal strip, sheet, &c.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD I. BRADDOCK.

Witnesses:
JAS. H. CHURCHILL,
J. MURPHY.