No. 656,501. Patented Aug. 21, 1900.

E. I. BRADDOCK.

GALVANIZING APPARATUS.

(Application filed June 11, 1900.)

(No Model.)

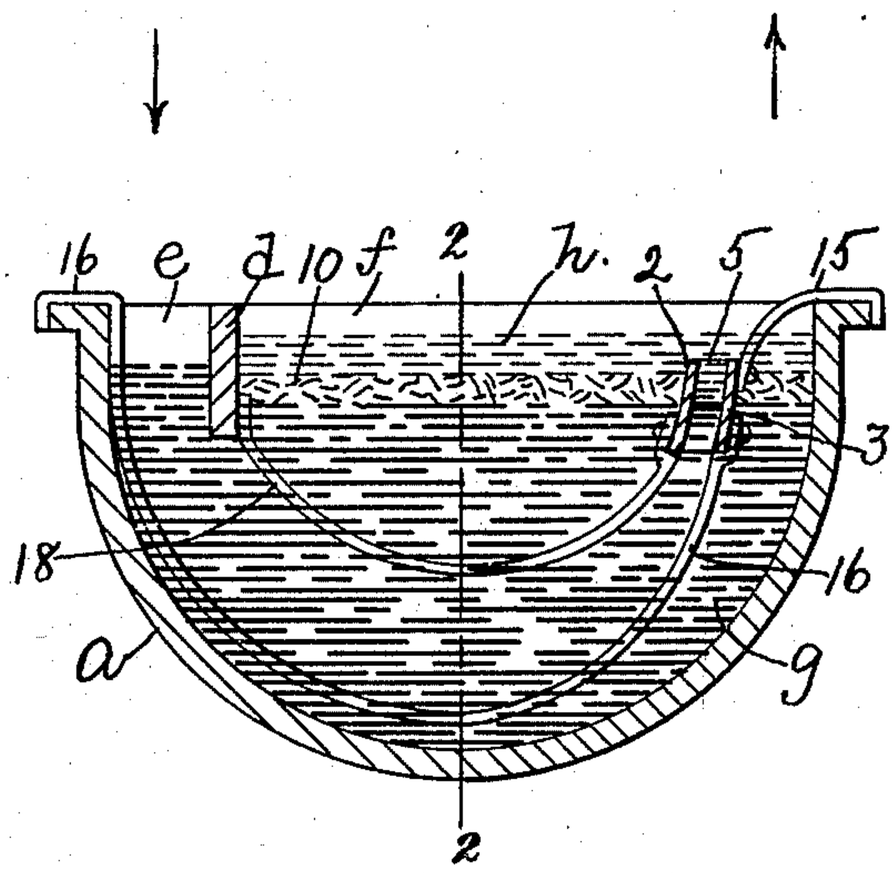

Fig. 1.

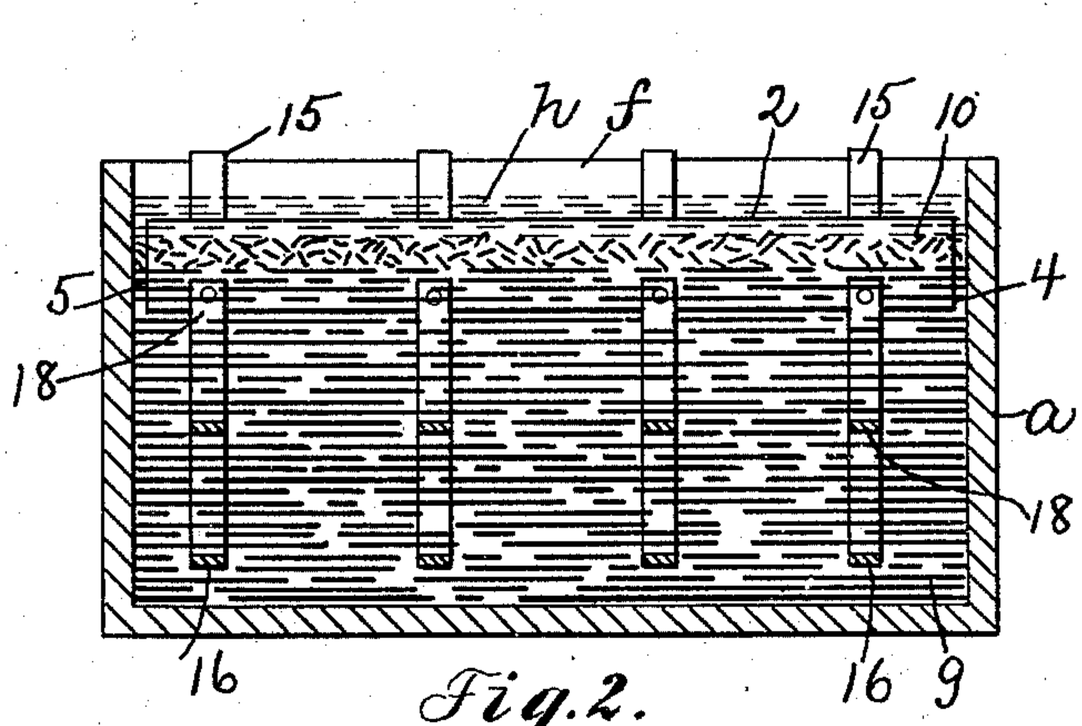

Fig. 2.

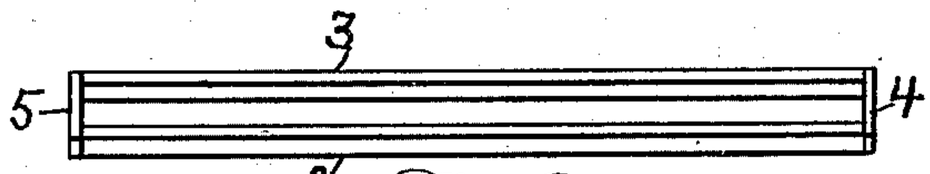

Fig. 3.

Witnesses.
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UNITED STATES PATENT OFFICE.

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. 656,501, dated August 21, 1900.

Original application filed March 24, 1900, Serial No. 9,983. Divided and this application filed June 11, 1900. Serial No. 19,831. (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 characters 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 this present invention is to provide apparatus with which the surface area of dross through which the iron or steel trip 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 a substantially-wide kettle or vat provided at one side with means, such as a partition-wall, to form a substantially-narrow entrance-chamber for the sheets, &c., and a substantially-wide chamber, and provide within the wide chamber, near the opposite side of the kettle, a substantially-narrow cut-off box, forming a substantially-narrow outlet passage-way for the sheets, &c., and also provide the kettle intermediate of the narrow entrance-chamber and the cut-off box with means arranged to guide the sheets, &c., continuously or in one direction from the entrance-chamber, through the kettle, and into the narrow outlet passage-way.

In order to practice the process above referred to with this present apparatus, the wider chamber of the kettle contains a bath of zinc or its alloys resting on a bath of lead or its alloys, which latter extends up into the entrance-chamber and also partially fills the narrow outlet passage-way, the remaining portion of said outlet passage-way being filled by the zinc or its alloys floating above it on the lead-bath, so that as the portion of the galvanizing-bath within said 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, while at the same time 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, &c., is passed. The dross formed 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 without interference with or detriment to the galvanized strip, sheet, &c., and is prevented from flowing back into the passage-way by the walls of the same, 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; Fig. 2, a longitudinal section of the apparatus shown in Fig. 1 on the line 2 2 looking toward the right, and Fig. 3 a plan of the cut-off box shown in Fig. 1.

Referring to the drawings, *a* represents a kettle or vat provided at one side with means (shown as a partition-wall *d*) for separating the upper portion of the kettle *a* into a substantially-narrow entrance-chamber *e* and a substantially-wide chamber *f*, which contains within it, near the opposite side of the kettle, a substantially-narrow cut-off box, which may be formed separate from the kettle, as herein shown, and comprises side walls 2 3 and end walls 4 5. (See Fig. 3.) The cut-off box forms a substantially-narrow outlet passage-way for the sheet, &c., and in practice the kettle *a* contains a bath *g* of lead or its alloys and a bath *h* of zinc or its alloys, which latter bath floats on the portion of the lead-bath within the wider chamber *f*. The cut-off box is suitably supported within the kettle *a*, with its upper edge below the upper surface of the zinc or galvanizing bath and its

lower edge below the surface of the lead-bath, and the said cut-off box may be supported, as herein shown, by means of suitable hangers 15 16, which latter are above the bottom of the kettle and serve as the lower runs or guides for the continuous passage in one direction of the metal sheet, &c., from the entrance-chamber at one side of the kettle into and through the kettle and out therefrom through the narrow outlet passage-way at the opposite side of the kettle. The kettle *a* may also contain within it a second or upper set of guides 18, which, as shown, are attached at one end to the cut-off box and have their other end resting against the partition-wall *d*. The lower set of guides prevents the sheet scraping on the bottom wall of the kettle and the upper set prevents the sheet floating in the lead out of the path of the outlet passage-way.

With the apparatus herein shown the sheets, strips, &c., to be galvanized are passed down through the entrance-chamber *e* into the lead-bath, and continuing in the same direction pass through the narrow outlet passage-way formed by the cut-off box and into and through the zinc-bath. The amount of dross formed in the narrow outlet passage-way by contact of the sheets, &c., with the zinc in said 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 strip up out of the outlet passage-way and into the body of the galvanizing-bath outside of said passage-way, in which the dross settles and accumulates, as indicated by 10, Figs. 1 and 2. The walls of the outlet passage-way effectively cut off the dross 10 and prevent it from flowing or running back into the outlet passage-way. It will thus be seen that the amount of dross formed in the outlet passage-way is restricted in area and is by the action of the metal sheets, &c., continuously removed from between the surface of the zinc and lead at the place where the metal sheet passes from the lead-bath into the zinc, and as the dross accumulates outside of the cut-off box it automatically feeds the zinc into the outlet passage-way.

This application is a division of my application, Serial No. 9,983, filed March 24, 1900.

I claim—

An apparatus for galvanizing strips, sheets, &c., comprising a substantially-wide kettle or vat, means within it at one side thereof to form a substantially-narrow entrance-chamber for the said sheets, &c., and a substantially-wide chamber, and a narrow cut-off box closed at its sides and ends and open at its top and bottom and located within the wider chamber near the opposite side of the kettle but below the upper edge thereof and at a substantially-wide distance from the said narrow entrance-chamber, and guides intermediate of the said entrance-chamber and cut-off box arranged to direct the metal sheets, &c., continuously or in one direction through the kettle and into the narrow cut-off box, substantially as and for the purpose specified.

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.