No. 656,502. Patented Aug. 21, 1900.

E. I. BRADDOCK.

GALVANIZING APPARATUS.

(Application filed June 11, 1900.)

(No Model.)

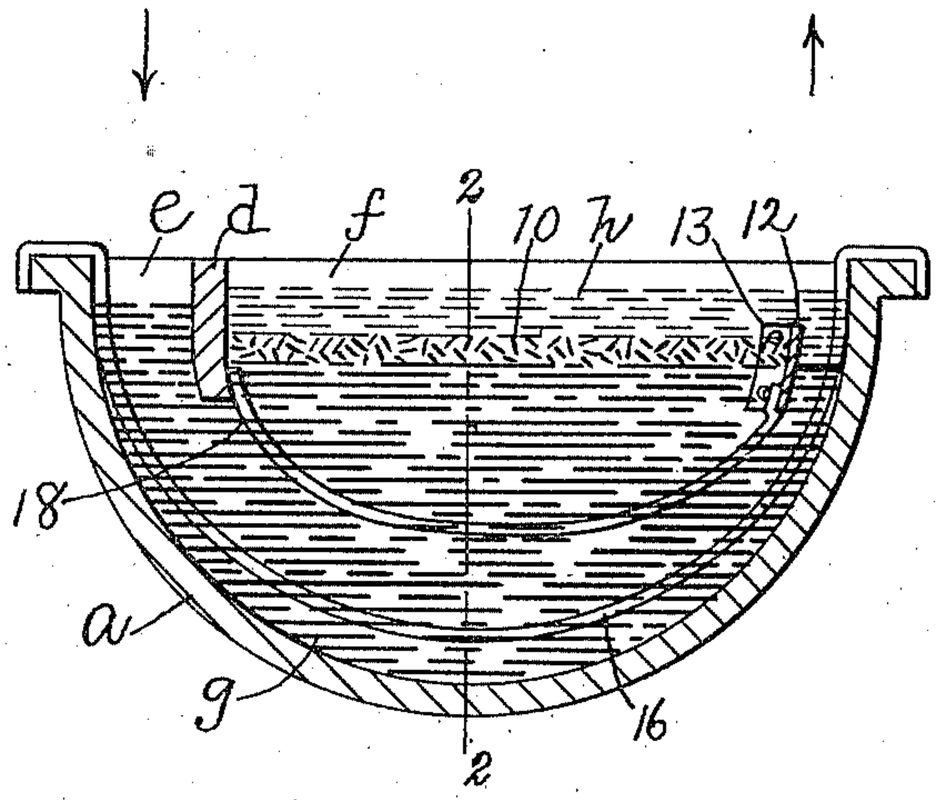

Fig. 1.

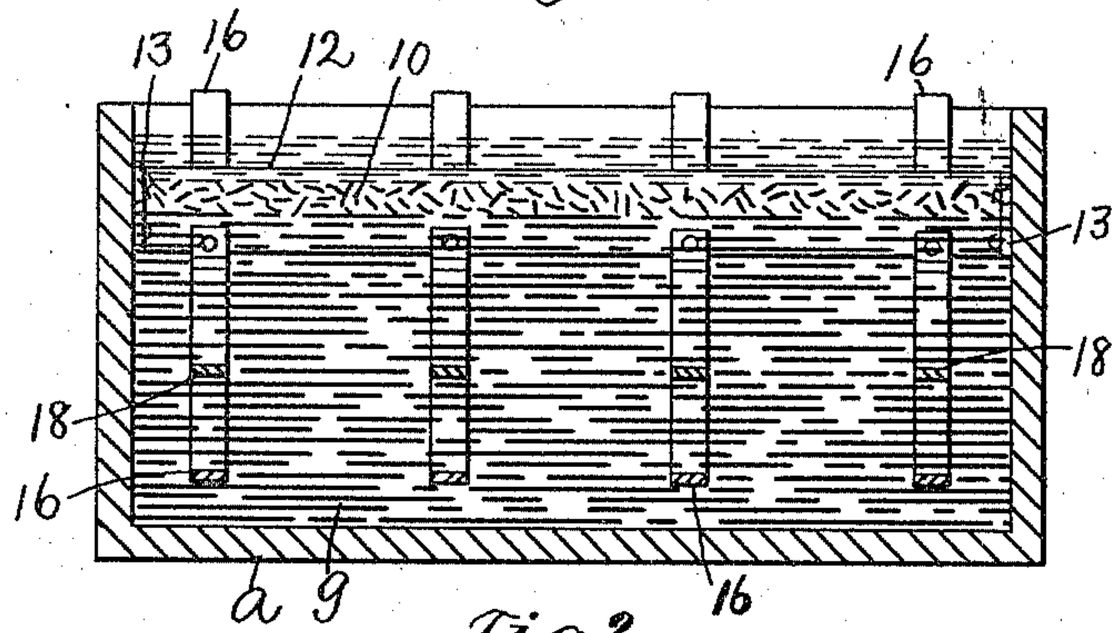

Fig. 2.

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. 656,502, dated August 21, 1900.

Original application filed March 24, 1900, Serial No. 9,983. Divided and this application filed June 11, 1900. Serial No. 19,832. (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 and numerals 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 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 bar which is secured to the end walls of the kettle and cooperates with the said end walls and with one side of the kettle to form a substantially-narrow outlet passage-way for the sheets, &c., and also provide the kettle intermediate of the narrow entrance-chamber and the said outlet passage-way 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., are 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 the invention, and Fig. 2 a longitudinal section of the apparatus shown in Fig. 1 on the line 2 2 looking toward the right.

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 bar or piece 12, provided at its ends with flanges 13, by means of which the said bar may be tightly secured to the end walls of the kettle, below its upper edge. The bar 12 coöperates with the end walls and with one side wall of the kettle to form 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 bar 12 is secured to the end walls of 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 kettle is provided intermediate of the entrance-chamber *e* and the narrow outlet passage-way with suitable means for guiding and directing the metal sheet from the entrance-chamber through the kettle and into the narrow outlet passage-way.

The means referred to may be made as herein shown and consists of a lower set of strips 16, which are supported by the opposite side walls of the kettle, and an upper set 18 of guiding-strips, secured at one end to the bar 12 and having 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 bar 12 and three walls of the kettle. The amount of dross formed in the narrow outlet passage-way by contact of the sheet, &c., with the zinc in the 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 in Figs. 1 and 2. The bar 12, forming one side wall of the outlet passage-way, effectively cuts off the dross 10 and prevents 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 sheet, &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 bar 12 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, means within the wide chamber near the opposite side of the kettle but below the upper edge thereof and at a substantially-wide distance from the said narrow chamber to form a narrow outlet passage-way for the said sheets closed at its sides and ends, and guides intermediate of the said entrance-chamber and said outlet passage-way arranged to direct the metal sheets, &c., continuously or in one direction through the kettle and into said outlet passage-way, 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.