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W. A. LEONARD.

GALVANIZING OR METAL COATING APPARATUS.

(Application filed Dec. 18, 1899.)

(No Model.)

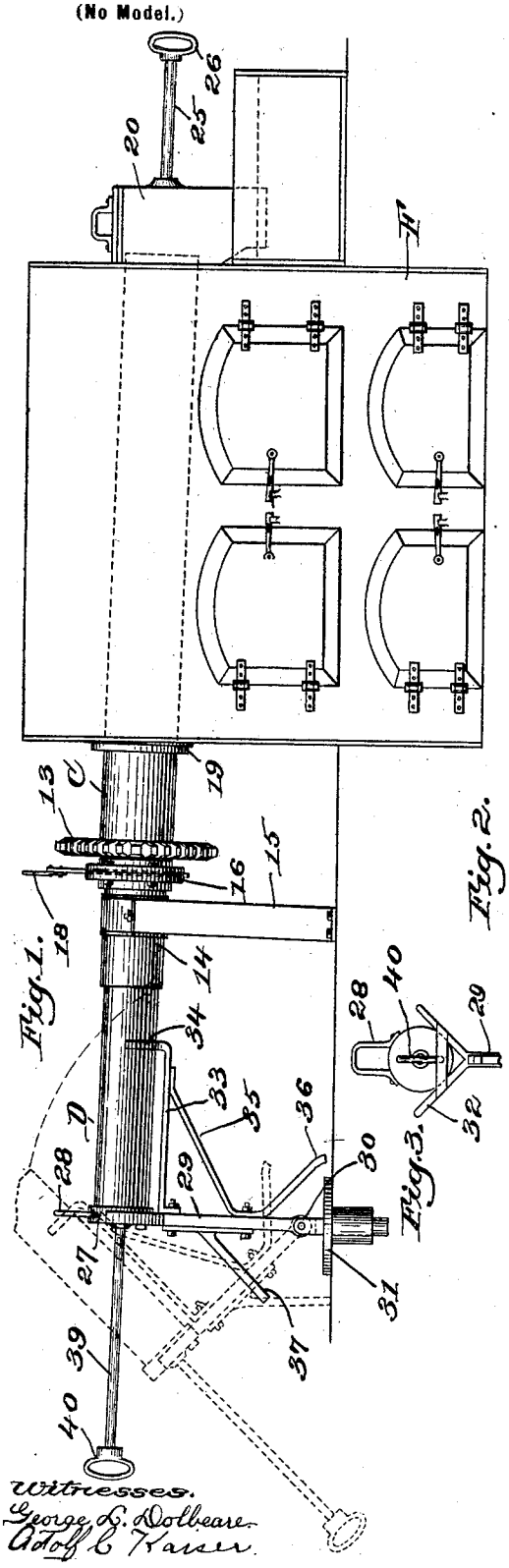


Fig. 1.

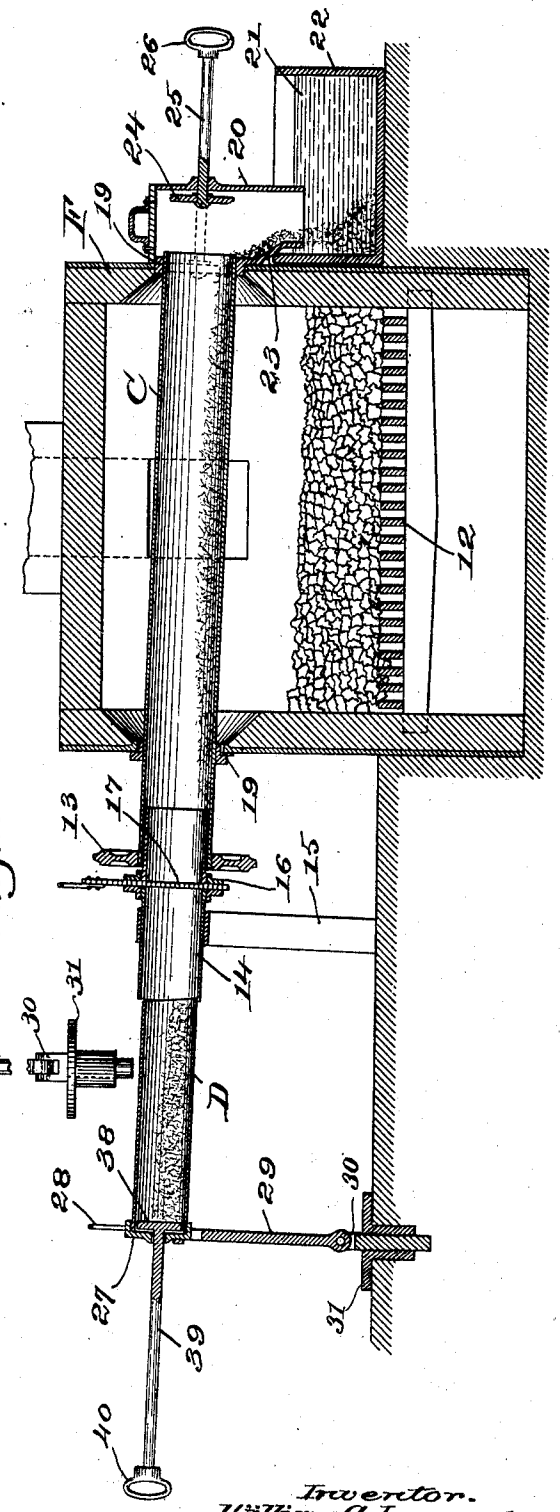


Fig. 2.

Fig. 3.

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GALVANIZING OR METAL-COATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 660,579, dated October 30, 1900.

Application filed December 18, 1899. Serial No. 740,648. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. LEONARD, a citizen of the United States, and a resident of West Wareham, county of Plymouth, State of Massachusetts, have invented an Improvement in Galvanizing or Metal-Coating 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 for galvanizing or metal-coating nails, tacks, screws, bolts, washers, and other articles, and it is shown and will hereinafter be described in one simple and convenient embodiment thereof.

In the drawings, Figure 1 is a side elevation of the apparatus. Fig. 2 is a longitudinal central section of the same, and Fig. 3 is a rear elevation of a portion of the carrier and charging device.

My improved galvanizing or metal-coating apparatus in the form thereof represented in the accompanying drawings includes in its organization a furnace and a container permanently connected therewith and adapted to be heated thereby, said container being adapted to receive the articles to be subjected to a high degree of heat during the galvanizing operation. For simplicity in construction the container consists of a longitudinal cylinder extending through the furnace-walls, and it has imparted to it, preferably, a continuous rotary motion, so as to bring all parts of the same to the action of the heat and likewise agitate the articles therein, so that all of them may be sufficiently heated. This rotation of the container or cylinder also serves to positively effect the feed of the nails, tacks, or other articles therealong, whereby these articles are discharged from the delivery end of the cylinder into a suitable water-receptacle, and the water in such receptacle serves to seal the delivery end of the container. Other means are provided for sealing or closing the receiving end, whereby the admission of air into the container during the galvanizing operation is prevented, since air by coming in contact with the highly-heated metal would cause heavy oxidation, and consequently ruin the work. In connection with the container I provide a charging device which is adapted to be coupled to the container. This charging device is adapted to receive the nails or other articles, which have been previously mixed with the necessary amount of zinc, tin, or other coating metal and flux. The charging device is then connected with the retainer and its contents are emptied into such container, after which the receiving end of the container is closed. The charges are introduced every few minutes, so as to maintain a steady supply of material passing through the container or cylinder, and by my apparatus I am enabled to metal-coat articles continuously and rapidly.

In Figs. 1 and 2 I have shown a furnace of the ordinary kind adapted to receive coal, charcoal, or other similar fuel to be sustained upon the grate 12. The furnace has openings to receive the fuel and to permit removal of the ashes, all as usual. It is obvious, of course, that any other type of furnace or fuel could be employed to equal advantage for heating the contents of the container.

The container illustrated is denoted by C, and it is shown consisting of a cylinder passing entirely through the furnace and slightly inclined, said container being given a rotary motion which promotes the passage of the articles therethrough and distributes said articles in such manner that all of them are subjected to the action of the heat.

The container C is shown provided at one end with the sprocket-wheel 13, connected by a sprocket-chain with a suitable driving sprocket-wheel, (not shown,) this constituting a simple means for rotating the container, although it is evident that other mechanism could be utilized for the same purpose.

The charging end of the container C receives the cylinder 14, the fit between the two parts being a snug one and the said cylinder 14 being sustained by the standard 15. The cylinder 14 is intersected by the casing or boxing 16, adapted to receive for sliding movement the gate or valve 17, which when shut, as represented in Figs. 1 and 2, is adapted to prevent the admission of air into the container C at the charging end thereof. When the gate 17 is opened by means of the

handle 18, secured to the upper side thereof, the articles that are to be galvanized or metal-coated can be delivered into the container.

The container C is supported at its delivery end by the bearing-sleeve 19, which is a part of the boxing or casing 20 and is supported at its charging end by the bearing-sleeve 19, which is attached to the binding-plates of the furnace.

The delivery end of the container C is inclosed by the boxing or casing 20, the lower end of which is open and is located below the surface of the water 21 in the tank or vessel 22, said water being maintained at a uniform level by means of supply and overflow pipes (not shown) and serving to seal the delivery end of the container C against the admission of air.

The articles discharged from the container C in falling strike first upon an inclined portion 23 of the interior wall of the boxing or casing 20, and thence pass into the water in tank 22.

It sometimes happens that flux or other material accumulates at the delivery end of the container C, and this accumulation would tend to prevent the free discharge of the articles therefrom. To prevent such accumulation, I provide a scraper which is adapted to be brought in contact with the inner wall of the container C and to scrape the same. The scraper is shown consisting of a disk 24, the diameter of which is approximately the same as that of the inside of the container C, in which it can be moved forward and back, thus removing the accumulation. This scraper or disk 24 is located within the stationary casing 20 and is connected to the stem or shank 25, extending through an opening in the wall of the casing 20, opposite the delivery end of the container C and provided with a handle 26, by which it may be manipulated. The scraper is shown as being in its idle position in Fig. 2. By pushing it may be caused to enter the delivery end of the container C, and by drawing it back and forth therein all foreign matter can be readily removed from said container C. When this operation is concluded, the scraper can be returned to its idle position out of the path of the moving nails or other articles. This scraper can be used also as a valve, as shown by dotted lines in Fig. 2, for the delivery end of the container to retard the passage of the articles to be treated until such time that they shall have reached the desired temperature and are properly coated.

The articles to be galvanized or metal, coated are first mixed with zinc, tin, or other coating metals and a flux, and the mixture is preferably introduced into a charging device, as D. The charging device is represented as consisting of a cylinder open at one end and closed at the other by the cap 27, said cap having a handle 28, by which the charging device or cylinder D may be readily handled. The charging device is supported by a cradle-like frame or carriage, including in its construction the standard 29, swiveled, as at 30, at its lower end to a pin fitted loosely into the fixed plate 31, which pin is free to revolve in its socket. The standard 29 is shown as being of Y shape, the closed end of the charging device D being adapted to lie in the bifurcated portion 32 of the standard. The horizontal arm 33 is secured to the standard 29 and extends therefrom, it having the upwardly-extending bifurcation 34 in alinement with the bifurcation 32 and adapted to receive the open end of the charging device. The diagonal brace 35 is secured to the under side of the arm 33 and also to the standard 29 and is continued downward and beyond its point of attachment to said standard to form a leg or prop 36. The opposite side of the standard 29 has secured thereto a substantially similar lug or prop 37.

The charging device D is free of or separable from the frame which sustains it, and this charging device is adapted to be detachably connected with the container C, the cylinder 14 constituting a convenient coupling for uniting the two parts C and D.

The charging-cylinder D normally fits within the coupling-cylinder 14, as indicated in both Figs. 1 and 2, and contains the plunger 38. (Shown in its extreme backward position in Fig. 2.) The plunger 38 is equipped with a stem 39, provided with a handle 40.

In operation the charging device D will be disconnected from the coupling-cylinder 14 and tilted, as shown by dotted lines in Fig. 1, and it may be swung around, if necessary, to bring its open end in better position to receive the charge. While thus tilted, the articles to be galvanized or metal-coated, which are mixed with zinc, tin, or other coating metals, and a flux, are then emptied into the charging-cylinder and the latter is returned to its initial position. (Shown in Fig. 2.) The gate 17 is then elevated so that the charging-cylinder D can be fully entered into the coupling-cylinder 14 and partially within the container C and until the cap 27 strikes the coupling-cylinder. The plunger 38 will then be pushed in, so that the contents of the cylinder D will be delivered into the container C. After this the charging-cylinder D will be withdrawn and the gate 17 closed. The container C, being then rotated, will cause the even distribution of the contents thereof and their movement toward tank 22, and said contents will be subjected while passing through the container C to a high temperature, and the zinc, tin, or other coating metal that was charged in with them will become liquefied and will evenly coat the articles, which will drop from the container C into the tank 22.

The articles to be coated after their introduction into the container C are not subjected to the action of atmospheric air, and the apparatus is of such character that the

container may be charged at very close intervals, the articles being continuously delivered in their finished state into the tank 22.

The apparatus in practice has been shown highly efficient, its output materially exceeds the output of those now in common use, and it is very simple in construction and in operation.

The invention is not limited to the construction previously described, for this may be materially modified within the scope of the accompanying claims.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a galvanizing or metal-coating apparatus, a furnace, a container for the articles to be galvanized or metal-coated, adapted to be heated by said furnace, a water-tank, a casing surrounding the delivery end of the container and having its lower opening below the surface of the water in said tank, and a scraping device for the container.

2. In a galvanizing or metal-coating apparatus, a furnace, a container adapted to be heated by the furnace, means for rotating the container, a coupling device connected with the container and provided with a gate, and a charging device detachably connected with the coupling device.

3. In a galvanizing or metal-coating apparatus, a furnace, a container, adapted to receive the articles to be galvanized or metal-coated, a charging device for the container adapted to be detachably connected therewith, and a swiveled frame for sustaining the charging device.

4. In a galvanizing or metal-coating apparatus, a furnace, a container adapted to receive the articles to be galvanized or metal-coated, a charging device for the container adapted to be detachably connected therewith, a movable frame for sustaining the charging device, and a plunger in said charging device serving to force the articles therefrom.

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

WILLIAM A. LEONARD.

Witnesses:
HEATH SUTHERLAND,
FREDERICK L. EMERY.