Jan. 29, 1924. 1,482,066

L. T. CURTIS

GALVANIZING RACK

Filed March 7, 1921 2 Sheets-Sheet 1

Fig. 1.

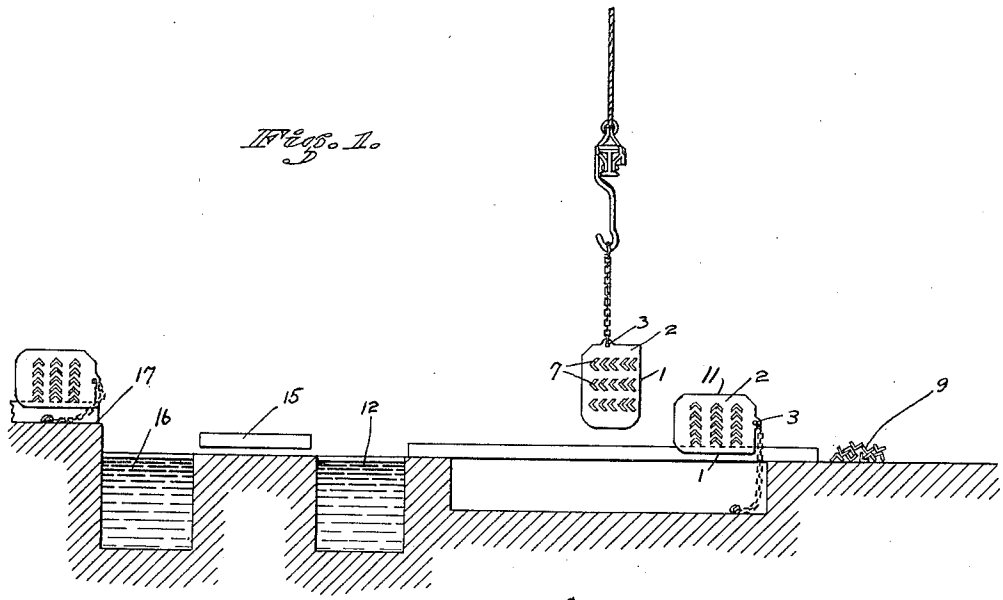


Fig. 2.

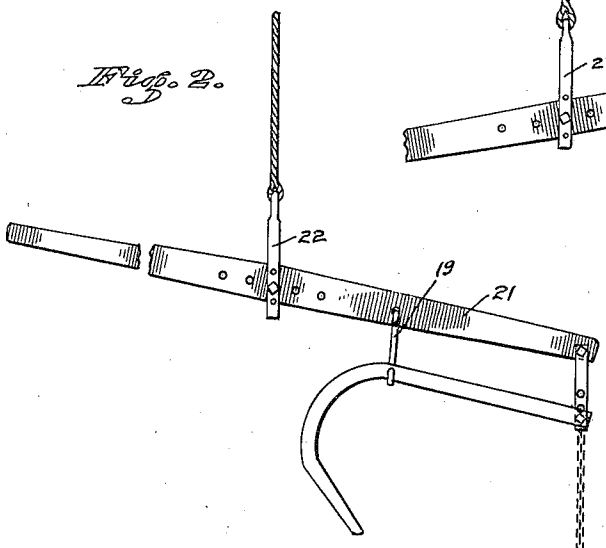
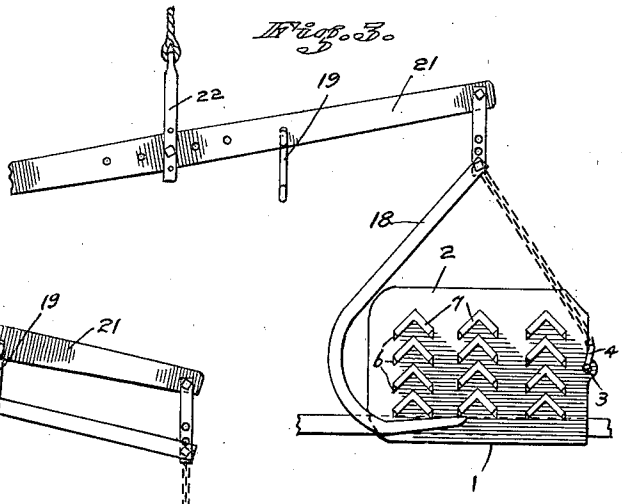
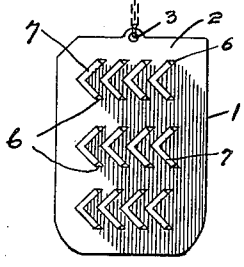


Fig. 3.





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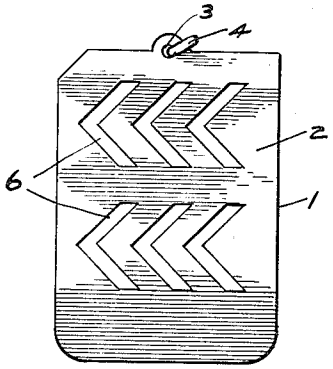


Fig. 4.

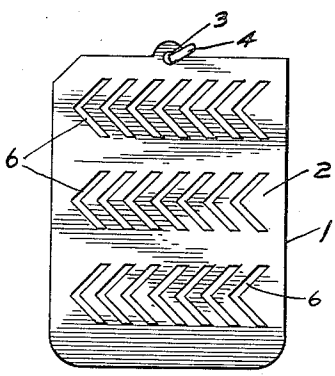


Fig. 5.

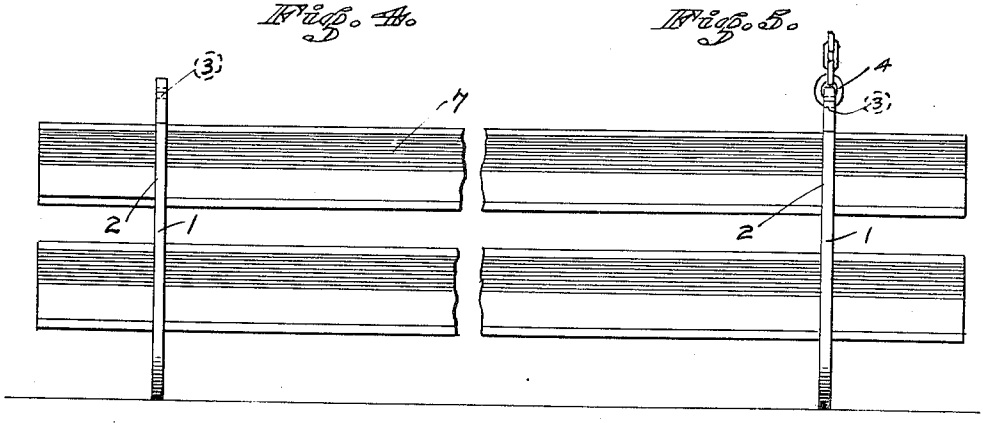


Fig. 6.

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UNITED STATES PATENT OFFICE.

LEONARD T. CURTIS, OF BURLINGAME, CALIFORNIA.

GALVANIZING RACK.

Application filed March 7, 1921. Serial No. 450,442.

To all whom it may concern:

Be it known that I, LEONARD T. CURTIS, a citizen of the United States, and resident of Burlingame, county of San Mateo, and State of California, have invented a new and useful Galvanizing Rack, of which the following is a specification.

The present invention relates to improvements in the method and apparatus for galvanizing structural steel and its object is to provide a means by which a plurality of steel bars such as angles, channels, I beams, etc., may be conveniently handled simultaneously in the various steps to be taken in the galvanizing process. In galvanizing structural material it is essential to keep the steel bars separate during the dip in the galvanizing bath, while they are being cooled, and until they are plunged into water for the final setting and cooling. It is also essential to provide means for jarring off any surplus of zinc coating and for continuously rotating the said bars during the short time that the coating is cooling on the steel, so as to avoid an uneven distribution of the coating; and lastly, it is essential that the bars should be held in such a position while entering the bath that no air pockets can be formed which would prevent a complete coating, and that, while being withdrawn, no reservoirs should be formed which would hold the galvanizing liquid.

It is the object of my invention to provide a movable rack adapted to receive a plurality of said steel bars and to hold the same throughout the various steps constituting the galvanizing process. A further object is to provide means for conveniently handling said racks, for lifting and lowering them, for rocking and jarring them and for suspending them from a crane in different positions.

I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which Figure 1 shows my racks in actual operation, the same being handled by a large crane not shown in the drawing, Figure 2 shows my racks operated by a hand lever, Figure 3 the same racks in a different position. Figures 4 and 5 enlarged detail views of different forms of racks, and Figure 6 an end view of the racks in Figure 4.

Referring to the drawings more particularly the principal part of my invention is the rack (1) consisting simply of two metal plates (2) of equal shape, having holes (3) in corresponding places, through which a ring (4) extends, by means of which the two metal plates may be suspended from any crane as suggested in Figure (1), or levers as shown in Figures (2) and (3). These two plates are perforated by a plurality of correspondingly arranged angular holes (6) adapted to receive a plurality of angle irons (7). I wish to point out here that while these plates are the principal feature of my invention, no particular importance is attached to their form, nor to the number and arrangement of the holes, nor to their shape, except that the latter should be similar to the cross-section of the steel bars to be handled, it being essential that the bars while fitting loosely cannot turn in said holes. In the interest of convenience I prefer an arrangement similar to that shown in the drawing, that is, an arrangement in regular rows and cross-rows. One rule about the arrangement of these holes should be observed to obtain the best results. As has been stated before, it is important that while being dipped the bars be so positioned that in being immersed they form no air pockets which might prevent the zinc from reaching every part of the surface, and that in being lifted out no reservoirs be formed to hold any of the galvanizing liquid and allow the same to solidify. By way of example, in being dipped the angle bars should not be turned toes down, like in Figure 3, nor toes up, but should be turned as shown in Figure 2, that is, the toes should be in the same vertical plane in this particular instance. Different shaped steel bars would of course require different positions for best results. Since this rule requires, roughly speaking, the largest dimension of the cross-section of the bars to approach the dip vertically, I shall refer to the corresponding holes hereafter and in the claims as being placed longitudinally with reference to their point of support.

The manner of operating these racks may be briefly described as follows:

The bars to be galvanized having been pickled and fluxed and dried thereafter, are ready for the galvanizing process as shown at (9). They are then placed into the racks

as shown at (11) and the racks are picked up by the crane, not shown in this drawing, and dipped into the galvanizing tank (12). After being dipped they are placed on the vibrating floor (15) well known in the art and therefore not described, where the racks and bars are jarred to remove surplus zinc, first toes down and then toes up and then rocked back and forth over the rounded corners of the rack plates as shown in the drawings, from one side to the other to properly distribute the zinc over the surface and prevent solidification of single drops, whereupon the racks are dipped into the water tank (16) and placed on the receiving platform (17), where the racks may be removed from the angles.

In case the plant is not equipped with a vibrating floor, my racks are excellently adapted to assist in producing the jarring motion necessary for the shaking off of the surplus.

In this case the jarring is usually done by lifting and suddenly dropping the bars. It will be remembered that the jarring should be done with the toes down, and to be able to lift the bars in this position I introduce the hook (18) the free end of which is, during the dipping process, carried on a hook (19) supported in the lifting means, as shown in Figure (2). After the racks are placed from the galvanizing tank on the floor, they are caused to fall over sideways, by a forward or backward pull on the lifting chain, to assume the position indicated in Figure 3 and the hooks are slipped under the bars as shown in the same figure. Now the racks may be lifted a short distance and dropped several times to thoroughly jar the bars and then rocked back and forth to distribute the zinc.

If no regular crane is available, or if the steel bars are of light weight so as to admit of easy handling by a couple of men, my lever shown in Figures 2 and 3 may be used to advantage. It consists of two lever bars (21) fulcrumed in the clamps (22) suspended from sliding trucks not shown in the drawing by means of ropes or cables (25). The ends of the short lever arms carry the racks while the larger arms are handled by the operators.

The operation of this apparatus does not essentially differ from that of the racks suspended from the crane. After the racks have been filled in the manner shown at (11) in Figure 1 two men take hold of the rear ends of the levers, lift the racks by pulling the rear ends of the lever downward and push the racks forward until the latter reach a position above the galvanizing tank (15). They are then lowered into this tank, lifted and again pushed forward until they reach the vibrating floor. After having been lowered to this floor, the levers are pushed forward again whereby the racks are caused to fall over into a horziontal position like that shown at (11) Figure 1. Now the hooks (18) are engaged with the angle irons and the latter are jarred by lifting and dropping the same in rapid succession. Moving the racks forward again and dipping the angle irons in the water tank (16) completes the process.

While I have so far confined myself to the galvanizing process proper, it is evident that the bars may be slipped into the racks even before the pickling and fluxing of the same, so that a plurality of bars may be handled simultaneously throughout the whole process.

I claim:

1. In means for simultaneously handling a plurality of metal bars for hot galvanizing, a plurality of metal plates with correspondingly spaced similar perforations in each adapted to receive therethrough said metal bars, means for suspending said plates vertically on edge and spaced horizontally from one another for supporting the bars horizontally arranged and projecting therethrough.

2. In means for simultaneously handling a plurality of structural bars for hot galvanizing, a metal plate with suspension means at one edge thereof, a plurality of spaced perforations therethrough adapted to loosely receive the bars, said perforations being arranged with their longest dimensions extending longitudinally with respect to the suspension means, whereby the surplus molten metal will run off of bars supported horizontally in the perforations.

3. In means for simultaneously handling a plurality of structural bars for hot galvanizing, a plurality of metal plates with corresponding spaced perforations in each adapted to loosely receive the bars therethrough, means for suspending the plates vertically from one end each on edge and laterally spaced from one another, the perforations in the plates being arranged with their longest dimensions extending longitudinally with respect to the suspension means, whereby the surplus molten metal will run off of the structural bars supported horizontally in said perforations.

4. In means for simultaneously handling a plurality of structural bars, a metal plate with suspension means at one end, a plurality of spaced perforations therethrough adapted to loosely receive the bars, said plate being of oblong form with corners removed to adapt it for rolling over from one edge to another.

5. In means for simultaneously handling a plurality of metal bars, the combination of a plurality of levers movably supported, a plurality of metal plates adapted to be suspended from corresponding ends of said

levers and to carry a group of said metal bars horizontally disposed therethrough in spaced relation to each other.

6. In means for simultaneously handling a plurality of structural steel shapes, the combination of a plurality of levers movably supported, a plurality of vertical metal plates adapted to be suspended from corresponding ends of said levers and to carry said shapes in spaced relation to one another, and a plurality of hooks supported by said levers and adapted to give another point of support to said plates.

7. In means for simultaneously handling a plurality of structural steel shapes, the combination of a plurality of levers movably supported, a plurality of vertical metal plates adapted to be suspended from corresponding ends of said levers, perforations arranged in each plate for loosely supporting the shapes in spaced relation extending therethrough, and a plurality of hooks supported on said levers adapted to give another point of support to said plates.

8. The method of galvanizing metal bars, comprising the assemblage of said bars horizontally grouped and spacedly arranged in racks having a plurality of outer supporting edges, dipping the said assemblage in molten metal, withdrawing said assemblage and of jarring the bars by tipping the racks from one set of supporting edges to another.

9. The method of galvanizing structural steel bars comprising the assembling of said bars horizontally grouped in and protruding through the racks, said racks being arranged to space said bars and loosely hold them against twisting and having a plurality of outer supporting edges, dipping the assemblage in molten metal, withdrawing said assemblage and jarring the bars by tipping the racks from one set of supporting edges to another.

LEONARD T. CURTIS.