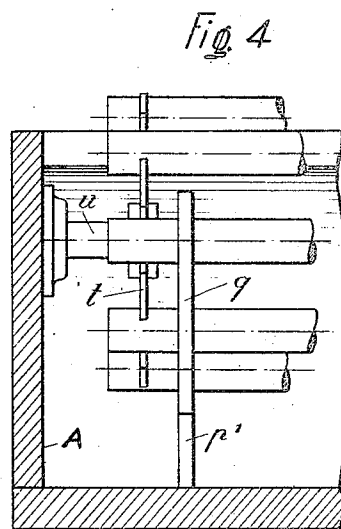
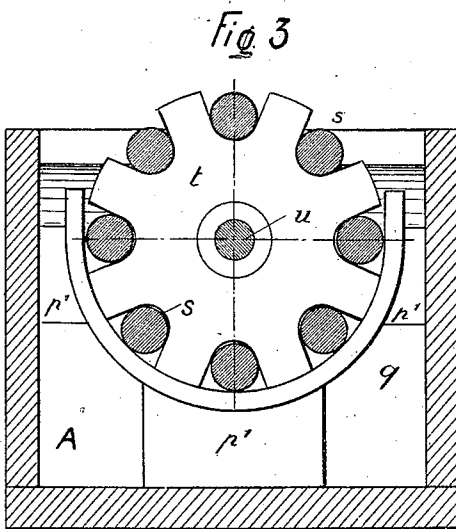
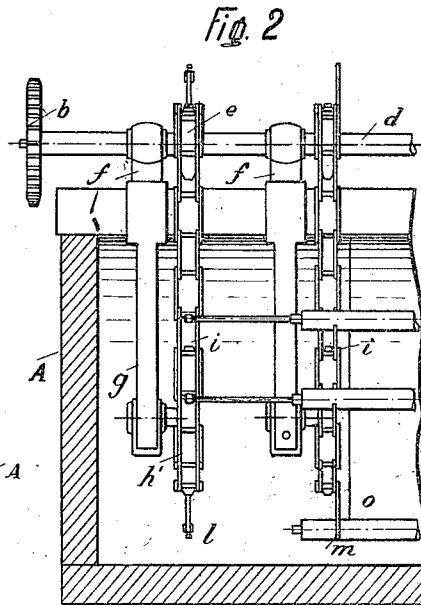
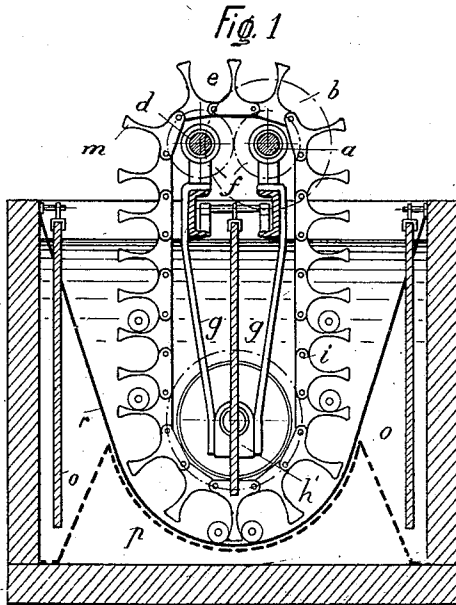


F. WERTH.
 APPARATUS FOR GALVANIZING METAL TUBES, RODS, AND THE LIKE.
 APPLICATION FILED JULY 21, 1910.

1,015,863.

Patented Jan. 30, 1912.

2 SHEETS—SHEET 1.



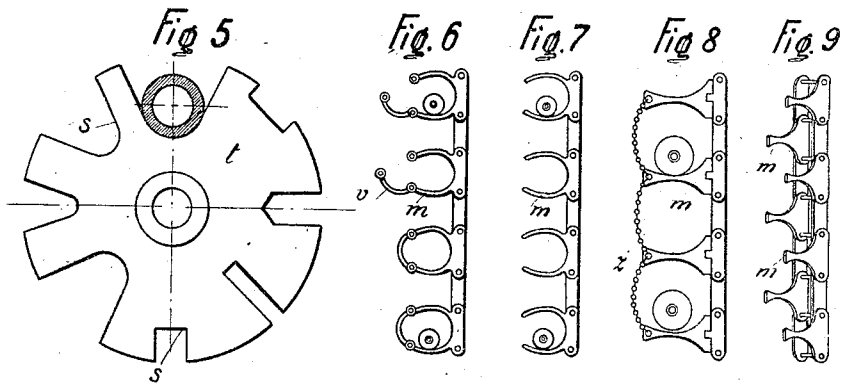
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UNITED STATES PATENT OFFICE.

FEDERICO WERTH, OF MILAN, ITALY.

APPARATUS FOR GALVANIZING METAL TUBES, RODS, AND THE LIKE.

1,015,863.

Specification of Letters Patent.

Patented Jan. 30, 1912.

Application filed July 21, 1910. Serial No. 573,047.

To all whom it may concern:

Be it known that I, FEDERICO WERTH, a subject of the Emperor of Germany, residing at 18 Corso Vercelli, Milan, in the Kingdom of Italy, manufacturer, have invented certain new and useful Apparatus for Galvanizing Metal Tubes, Rods, and the Like, of which the following is a specification.

The specification of my patent No. 970149 describes an apparatus for electro-galvanizing metal tubes, rods and the like in which the holders or supports for the articles to be galvanized are arranged on endless rotating chains, bands or the like, the driving shafts of which being located outside the electrolytes. This application refers to further improvements of the said apparatus.

It has been found, that the rings serving for the support of the tubes, rods or the like to be galvanized, may advantageously be constructed to be opened or open permanently as by this means the introduction of the tubes, rods or the like is greatly facilitated. To this purpose it would be sufficient to provide only a single chain or band with open rings, the tubes or the like being in this case firstly inserted in the closed rings of the other chain, whereafter in the open rings of the first named chain and at least the open rings closed and secured in some convenient manner.

The different figures of the drawings show the improved apparatus, as well as the various forms of chain, and another form of embodiment of the invention.

Figure 1 illustrates a cross section and Fig. 2 a partial longitudinal view of the apparatus with the improved holders. Fig. 3 shows a cross section and Fig. 4 a partial longitudinal view of another form of embodiment of the invention. Fig. 5 illustrates a side view of a bearing means for the apparatus form, as shown in Figs. 3 and 4. Fig. 6 illustrates the forms of a closing device for open chain rings. Figs. 7, 8 9 illustrate views of different forms of open rings.

The form of rings or holders as illustrated in Figs. 1, 7 and 9 is better adapted to certain cases, as it facilitates the replenishment of the apparatus with the articles to be treated. The rings or holders are entirely open outward; they are either forked or horseshoe shaped and their two arms —*m*— are preferably bent inward, the cur-

vature being sufficient to prevent the tubes or rods from leaving the support even when the chain is running vertically.

To prevent the articles to be galvanized from leaving the open rings and from falling out, when the chain is running in the lower curve and the openings of the holders are directed downward, a suitably formed wooden block —*p*— is arranged in the tank beneath each of the chains, whereby the upper recessed periphery of this block lies closely around the lower curve of the chain, as it is shown in the Fig. 1 of the drawings by the dotted lines. The blocks need only extend to the height at which the arms of the forked rings or holders reach the horizontal position whereupon the tubes or rods are again retained by the curved arms themselves. The same result can be obtained by suspending a belt, band or the like —*r*— in the bath by fixing its ends to both walls of the tank and carrying it beneath each chain, as shown in Fig. 1. In this case likewise the articles are effectually prevented from leaving the holders by running in the lower curve.

Figs. 1 and 8 of the drawing show that each chain can be formed in such manner, that every chain member possesses a piece or arm —*m*— suitably arched or flared at both sides, so that two successive arms form together an open holder; this construction enables one to increase the number of tubes or rods to be supported on the same chain and therefore also the capacity of production.

When desired the rings or holders may be provided with closing means —*r*— as shown in Fig. 6.

The form of supports or holders illustrated in Fig. 8 is suitable for tubes of large diameter. Each arm —*m*— is fixed in convenient manner on every second chain member and can be removed or exchanged following the diameter of the tubes without any difficulty. The arms can be fixed also on each third or fourth chain member. In every case the space between two arms can be closed by means of a little chain —*z*— so that the belts —*r*— or the blocks —*p*— can be eliminated. The arms of the holders can likewise be made straight or of any other desired form.

The construction of Fig. 9 shows another form of chain, whereby each holder is formed with two arms, one of which is fixed on the

left side of a chain member and the other one on the right side of the next following chain member; by this manner during the rotation the goods change constantly the contact points with the supports, so that the galvanization results perfectly.

It should be noted that the tubes, rods or the like to be galvanized, still invariably remain in electrical contact also when the chain carrying them reaches the lower curve, as owing to the rotary movement, the arms —*m*— are in this position pressed against the tubes or rods.

Another form of embodiment of the invention may be given by the fact that the chains are substituted through supports —*t*— having a disk form, or similar rotation members, arranged in a suitable manner on the shaft —*u*— as shown in Figs. 3, 4 and 5, said disks being provided with recess —*s*— in which the ends of the rods or tubes are inserted. Such construction allows likewise a constant loading of the bath tank owing to the facility of substituting of the articles. To prevent the going out of the rods or tubes from the said recess, during the passage through the lower curve the bath-tank is provided with half-circular supports —*q*—, held by wooden blocks. —*p'*—. The same result can evidently also be obtained by employing belts or bands as it is previously described and shown in Fig. 1.

The Fig. 5 of the drawing illustrates a view of a disk with different sizes of openings enabling one to load articles of different dimensions.

What I claim and desire to secure by Letters Patent is:

1. In an apparatus for galvanizing metal tubes and the like, the combination of a tank having an electrolyte therein; a chain having its lower part passed into the electrolyte and having parts thereof vertically disposed, said chain comprising links having laterally projecting arms having its upper and lower edges concaved; and means for retaining

tubes and the like between said arms when the arms project downwardly.

2. In an apparatus for galvanizing metal tubes, rods and the like, the combination of a tank containing an electrolyte; pairs of upper sprockets above the electrolyte; lower sprockets in the lower part of the electrolyte; chains passed over one of said pairs and one of said lower sprockets, the part of the chains between the pair and lower sprockets being substantially vertical, said chains comprising links having laterally projecting arms provided with concaved upper and lower edges, said links projecting horizontally where the chain is vertical; and means having a concave part for holding the tubes or the like between the arms when the links pass under the lower sprockets.

3. In an apparatus for galvanizing metal tubes, rods and the like, the combination of a tank; an electrolyte therein; a frame resting on the tank and provided with parallel aligned upper bearings above the electrolyte; intergeared upper shafts in said upper bearings; stub-shafts on said frame at the lower part of the electrolyte; sprocket wheels on said shafts; chains each passed over a sprocket wheel on each of the upper shafts and a sprocket wheel on one of the stub-shafts, part of said chain being vertically disposed, said chains comprising links having laterally projecting arms having concaved upper and lower edges whereby tubes and the like will be held in place by gravity; and means having an arcuate face adapted to hold the tubes between said arms when the arms project downwardly when passing beneath the lower sprockets.

In testimony that I claim the foregoing as my invention, I have signed my name in the presence of two subscribing witnesses.

FEDERICO WERTH.

Witnesses:

ZOKAR PUMPUL,
W. LELRECHT.