April 12, 1932. J. WACHTER 1,853,525

CONVEYER

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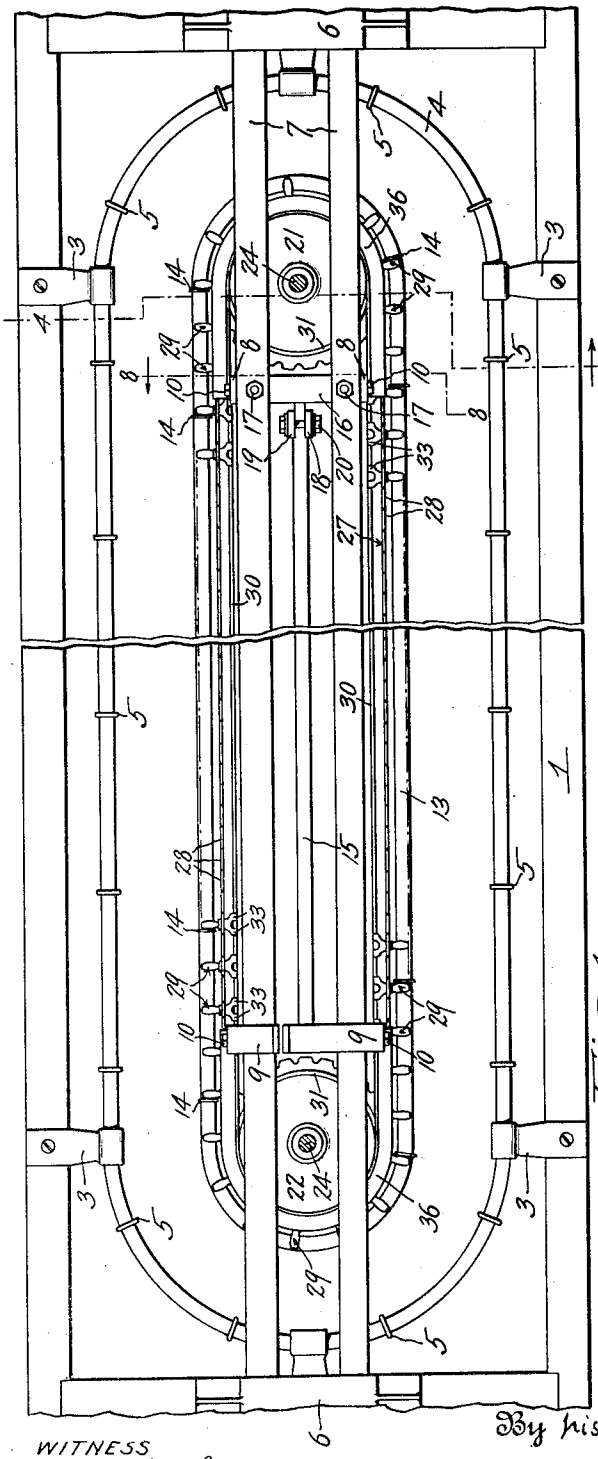

Fig. 1.

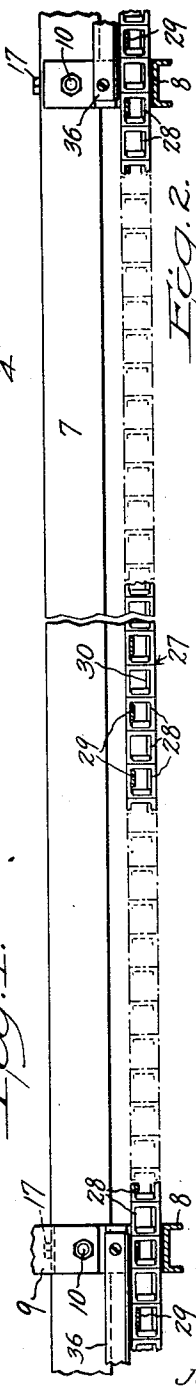

Fig. 2.

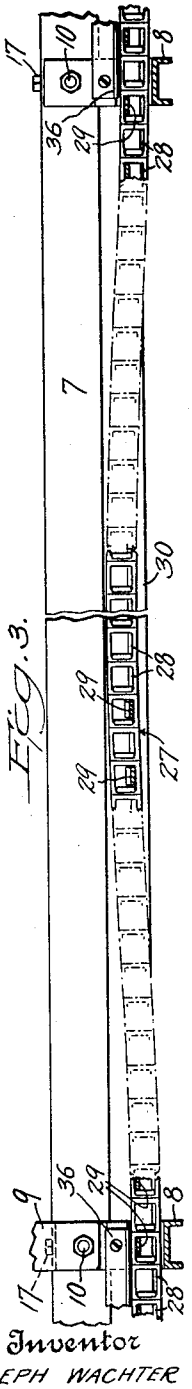

Fig. 3.

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Fig. 4.

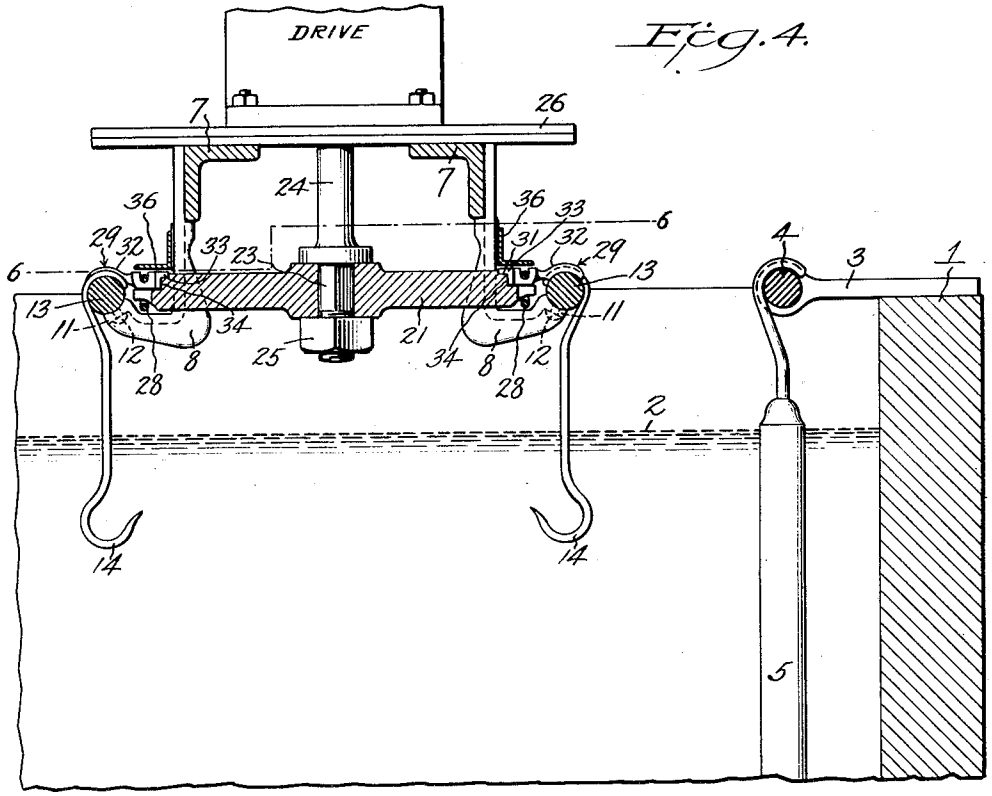

Fig. 5.

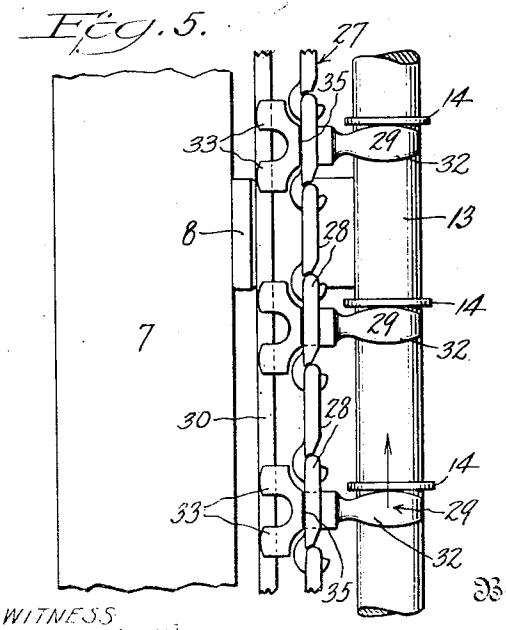

Fig. 6.

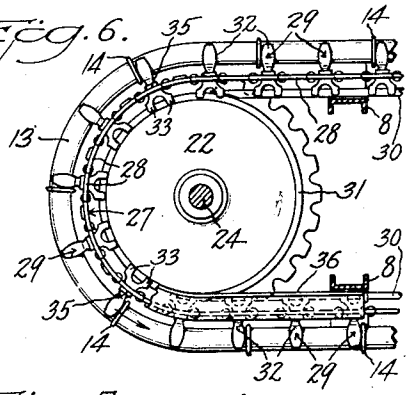

Fig. 7.

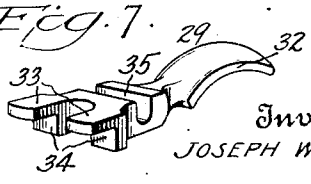

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Fig. 8.

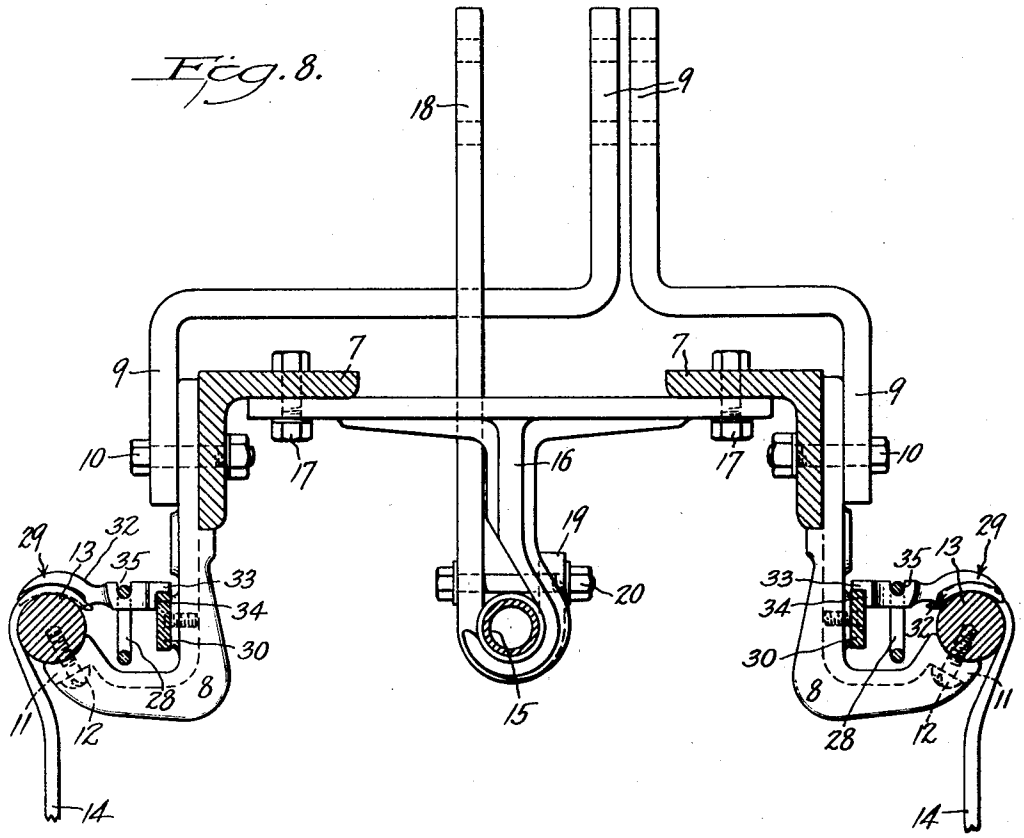
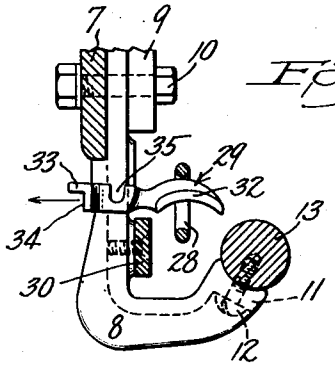


Fig. 9.



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UNITED STATES PATENT OFFICE

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CONVEYER

Application filed July 7, 1930. Serial No. 465,855.

This invention relates to conveyers in which a driver, usually a flexible belt or chain, propels articles along a rail or guideway.

The objects of the invention are to improve the construction of such conveyers by substituting simple standardized parts for the specially designed and relatively complicated conveyer and guideway units of the prior art, and to provide for quick and easy removal or insertion of standardized conveyer units in accordance with variations of the working requirements or the need for replacement of worn parts. Further objects of the invention and features of construction will be made apparent in the course of the following description.

By way of illustrative embodiment there is shown in the drawings and hereinafter described a continuously operating electroplating apparatus; but the invention is capable of many other uses.

In the drawings,

Figure 1 is a plan view, partly broken away, of an electroplating tank equipped with my improved conveyer;

Figures 2 and 3 are enlarged detail views in elevation of a portion of a conveyer chain and adjacent parts;

Figure 4 is a fragmentary transverse section on the line 4—4 of Figure 1;

Figure 5 is an enlarged fragmentary view in plan, based upon Figure 1;

Figure 6 is a horizontal section on line 6—6 of Figure 4;

Figure 7 is an enlarged perspective view of a bridge member;

Figure 8 is a transverse sectional view on line 8—8 of Figure 1, the central portion only being shown; and

Figure 9 is a fragmentary view vased upon Figure 8, but showing the parts in a different relation.

Referring to the drawings in detail, 1 designates a tank containing an electrolytic bath 2. Insulated brackets 3, secured to the side walls of the tank, support an anode bar 4, from which hooked anodes 5 depend into the bath. Frames 6, mounted on the end walls of the tank, support parallel angle girders 7 upon which the remaining parts of the apparatus are mounted.

Hangers 8 and bus bars 9 are secured by bolts 10 to girders 7. Hangers 8 are of channel form and have perforated end walls 11, through which machine screws 12 are tapped into the endless rail 13 which also serves as a cathode bar (Figures 1 and 7). Work supporting hooks 14 are hung upon the rail or cathode bar 13 at intervals in position to be propelled along the bar by the conveyer, which is the subject of the present invention.

In the center of the tank an additional anode bar 15 is carried by hangers 16, which are secured to the girders 7 by means of bolts 17 (Figure 8). A bus bar 18 has a lower hooked end 19, which is clamped around bar 15 by means of bolt 20.

At opposite ends of the tank, driving sprocket 21 and idler sprocket 22 are suspended from the girders 7. The mounting of the sprockets is shown in detail with reference to the driving sprocket in Figure 4. The sprocket is clamped upon squared portion 23 of stub shaft 24 by means of nut 25. The stub shaft is journalled in a bed plate 26, which rests upon girders 7, and also carries a suitable driving mechanism which is indicated diagrammatically.

An endless driver is provided, which, in the illustrative embodiment shown, takes the form of a chain 27, preferably composed of separable links 28 to facilitate assembling and adjustments of the length of the chain. The conveyer belt is also preferably perforated at regular intervals, and in the embodiment shown, the desired perforations are supplied by employing links of a rectangular ring form. Chain 27 is in mesh with sprockets 21 and 22, and is supported by bridge members 29 which pass through the links of the chain and rest at one end upon the outer rail or cathode bar 13, and at the other end upon inner rails 30, which are secured to the hangers 8 (Figure 8), and extend from sprocket to sprocket along each straight course of the conveyer. The supporting path formed by the rails 30 is completed by shoulders 31 on the upper faces of the sprockets. The shoulders lie in the plane of the rails 30 and in

tangential relation thereto, so that the bridge members, at their inner ends, are transferred from the rails to the shoulders when rounding the sprockets, while the sprocket teeth engage links 28 beneath the bridge members (Figure 4). It will be observed that the bridge members, as they slide along the rails, will carry with them the work supporting hooks 14. The outer rail or cathode bar is kept clean, and perfect electrical contact between the bar and work supporting hooks is thus maintained. The number of bridge members employed may be varied at will to correspond to the number of work supporting hooks employed at a given time.

The outer ends 32 of the bridge members are curved to conform to bar 13, and the inner ends are bifurcated to provide a pair of supporting lugs 33 and a pair of vertical abutting faces 34. The lugs 33 and abutting faces 34 engage rails 30 or shoulders 31, as the case may be, at two points, one of which is in advance of the longitudinal axis of the bridge members, and the other of which is rearward thereof. With respect to the vertical abutting faces 34, this arrangement resists the turning tendency of the bridge members under the forward pull of the chain and the backward drag of the work supporting hooks and the separation of the faces 34 gives two points of contact with the shoulders 31 so that the alignment of the bridge members is maintained while they are rounding the sprockets. Separation of the supporting lugs 33 assists the bridge members when passing from the rails 30 onto the shoulders 31, since the rear lug will not leave the rail until the forward lug is securely seated upon the shoulder. L-shaped guard plates 36 are shown and they may be continued over the straight courses of the chain, but are not essential to the invention. For a greater part of their length the bridge members are of a cross-section which permits them to be readily passed through the links 28, thus facilitating insertion or withdrawal of the bridge members as required. This operation of inserting or withdrawing bridge members is conveniently performed upon raising the chain in the middle of one of its straight courses, as shown in Figures 3 and 9. The bridge members are provided on their upper faces with slots 35 which snugly engage the links 28 to guide the chain and furnish additional resistance to pivotal movements of the bridge members.

The operation of the apparatus has been sufficiently indicated in the foregoing description and, in general, the operation does not differ from that of known electroplating apparatus. It will be seen, however, that in contrast with known conveyer systems of this type, the present invention employs a few simple and separable parts which are readily susceptible of standardization. The outer rail 13, inner rails 30, and the conveyer chain, are of the simplest possible construction, but perform all of the required functions by virtue of the bridge members which support the chain and at the same time engage and propel the work supporting hooks. The chain is subjected to the least possible wearing friction, and the elaborate especially designed devices of the prior art for supporting the chain and engaging the articles to be conveyed are eliminated. The construction is open and free from pockets which would become clogged with dirt.

I claim:—

1. A conveyer comprising in combination a pair of parallel rails, a driving chain parallel to and between the rails and composed of perforate links, and traveling bridge members supported upon the rails and each passing as a whole through the links.

2. A conveyer comprising in combination a pair of parallel rails, a driver parallel to and between the rails and having spaced perforations, and traveling bridge members supported upon the rails and passing through the perforations, said bridge members having longitudinally aligned guideways on their upper faces in which the driver lies.

3. A conveyer comprising in combination a pair of parallel rails, a driving chain parallel to and between the rails and composed of perforate links, and traveling bridge members supported upon the rails and passing through the links, said bridge members having grooves on their upper faces engaging the links, the grooves being elongated in the direction of travel.

4. A conveyer comprising in combination a pair of parallel rails, a driver parallel to and between the rails, traveling bridge members supported upon the rails and engaging the driver, and articles to be conveyed movably supported upon one or both of said rails in the path of said bridge members.

5. A conveyer comprising in combination a pair of parallel rails, a driver parallel to and between the rails, and a traveling bridge member supported upon the rails and engaging the driver, said bridge member vertically abutting at least one of the rails both forwardly and rearwardly of the point of engagement of the bridge member with the driver.

6. A conveyer comprising in combination a pair of parallel rails, a driver parallel to and between the rails, and a traveling bridge member supported upon the rails and engaging the driver, said bridge member having at each end a portion lying upon the adjacent rail for support, and a portion vertically abutting the rail to resist turning.

7. A conveyer comprising in combination a pair of parallel rails, a driver parallel to and between the rails, and a traveling bridge member supported upon the rails and engag-

ing the driver, said bridge member having at each end a portion lying upon the adjacent rail for support, and a portion vertically abutting the rail to resist turning, the vertically abutting portion at one end being elongated in the direction of travel.

8. A conveyer comprising in combination an endless driver mounted upon spaced wheels, an endless outer rail parallel to said driver, inner rails parallel to said driver and extending substantially throughout the spaces between said wheels, said wheels having flanges in the plane of and tangential to the inner rails, and traveling bridge members supported at their outer ends upon the outer rail and at their inner ends upon the inner rails or flanges, respectively.

9. A conveyer comprising in combination an endless driver mounted upon spaced wheels, an endless outer rail parallel to said driver, inner rails parallel to said driver and extending substantially throughout the spaces between said wheels, said wheels having flanges in the plane of and tangential to the inner rails, and traveling bridge members supported at their outer ends upon the outer rail and at their inner ends upon the inner rails or flanges, respectively, the inner end of each bridge member having a portion which lies upon the path formed by the inner rails and wheel flanges and a portion which vertically abuts the inner rails and wheel flanges.

10. A conveyer comprising in combination an endless driver mounted upon spaced wheels, an endless outer rail parallel to said driver, inner rails parallel to said driver and extending substantially throughout the spaces between said wheels, said wheels having flanges in the plane of and tangential to the inner rails, and traveling bridge members supported at their outer ends upon the outer rail and at their inner ends upon the inner rails or flanges, respectively, the inner end of each bridge member being bifurcated, each bifurcation having a portion which lies upon the path formed by the inner rails and wheel flanges and a portion which vertically abuts the inner rails and wheel flanges.

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