H. A. HALL & J. HERCKER.

MACHINE FOR GALVANIZING.

APPLICATION FILED APR. 21, 1908.

914,827.

Patented Mar. 9, 1909.

5 SHEETS—SHEET 1.

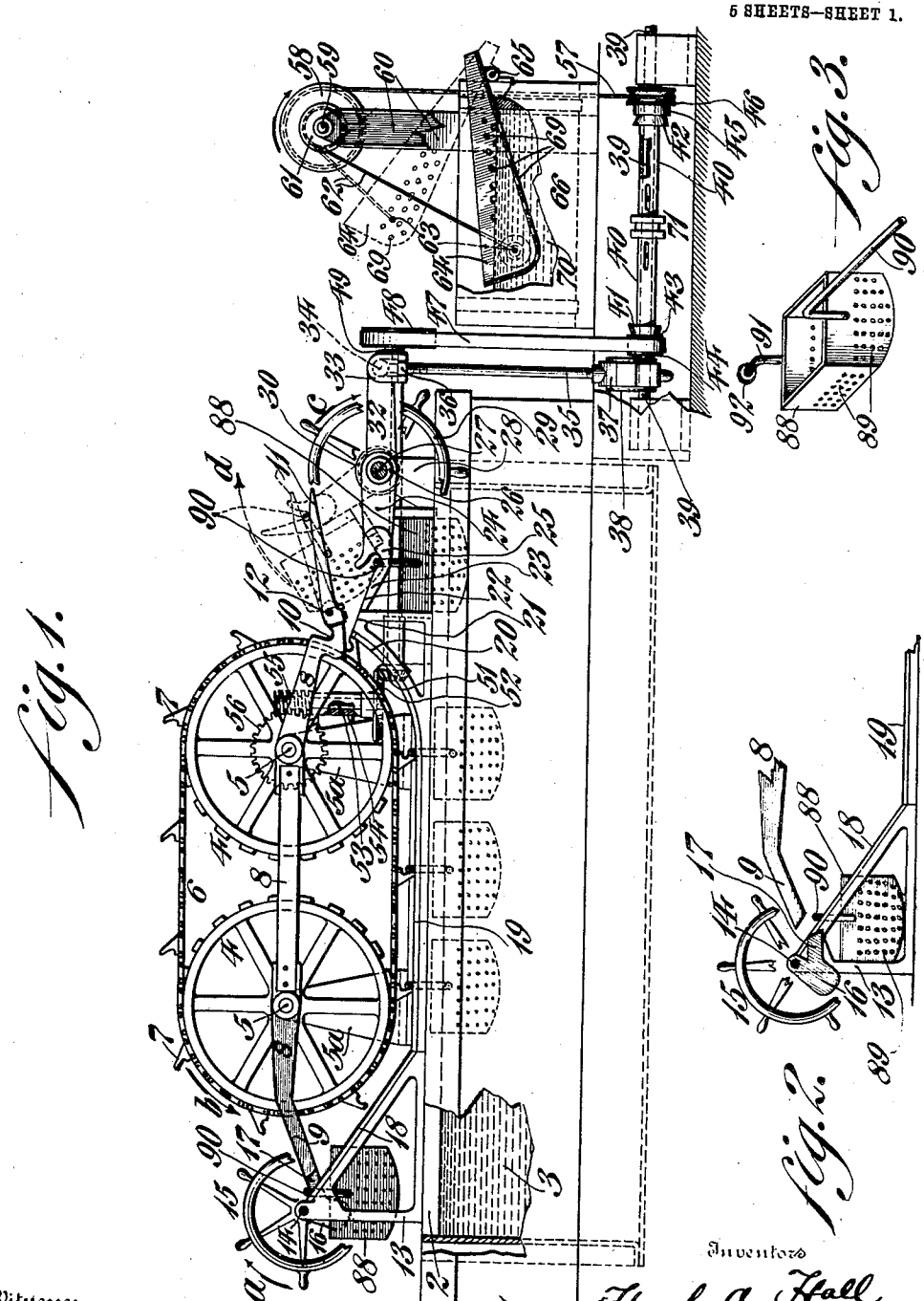


Fig. 1.

Fig. 3.

Fig. 2.

Witnesses

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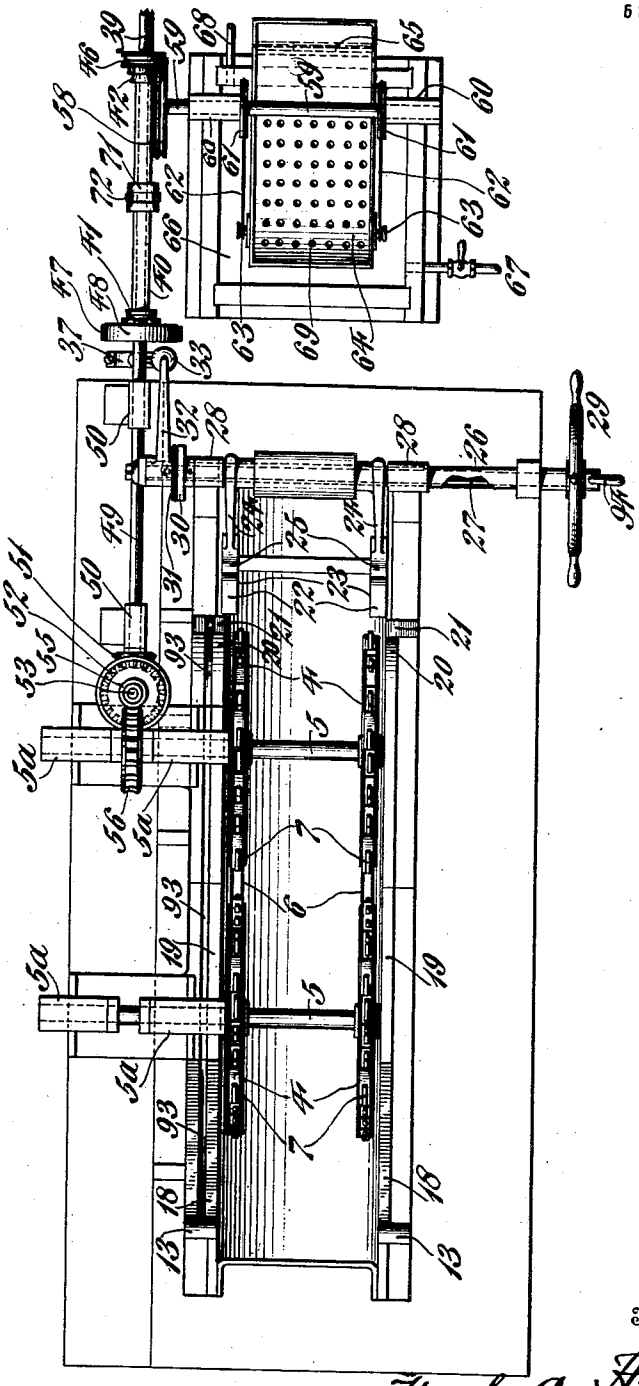
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5 SHEETS—SHEET 2.

Fig. 1.



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5 SHEETS—SHEET 3.

Fig. 6.

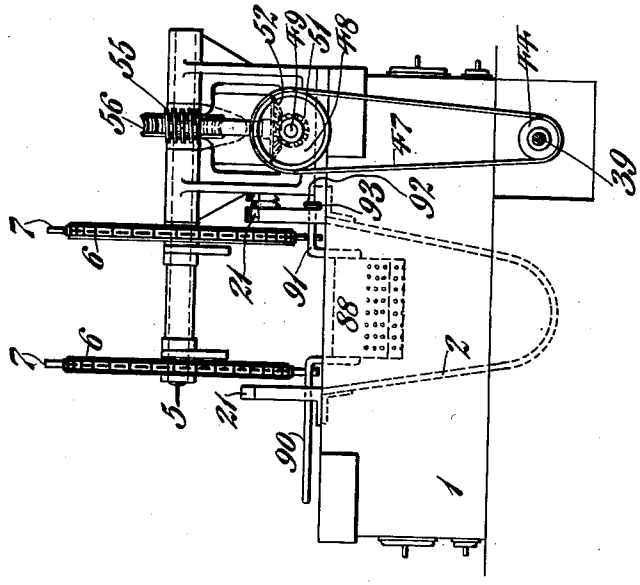
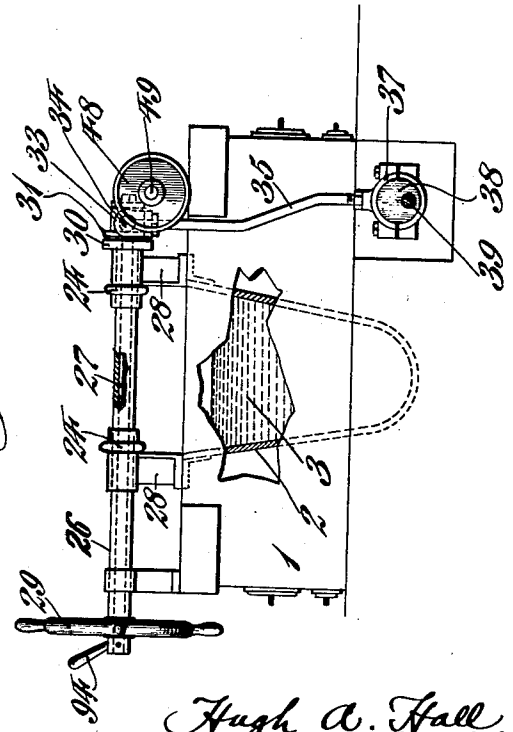


Fig. 5.



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5 SHEETS—SHEET 4.

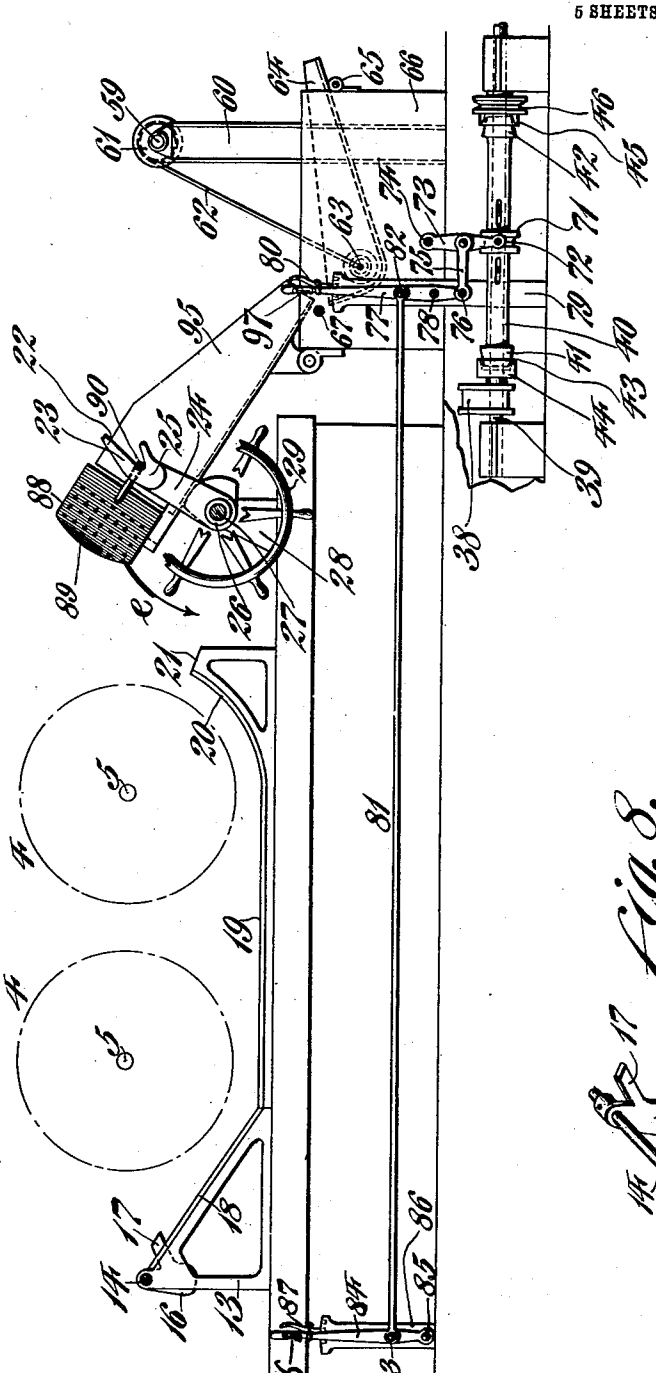


Fig. 7.



Fig. 8.

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5 SHEETS—SHEET 5.

Fig. 9.

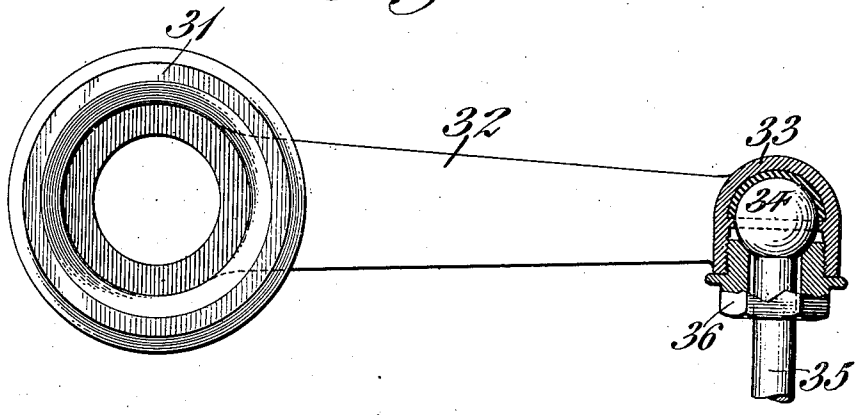


Fig. 10.

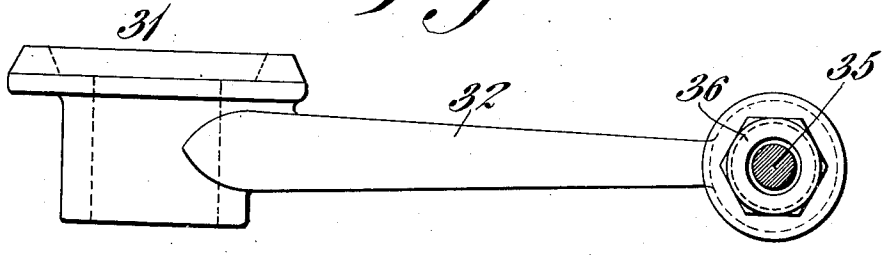
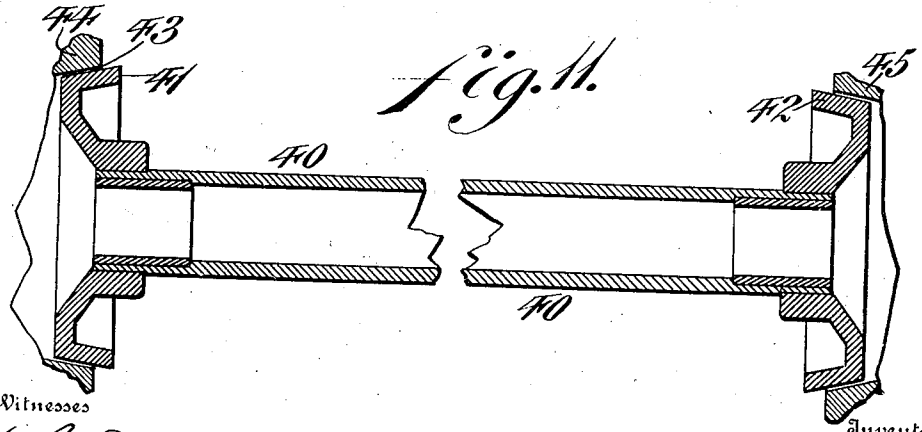


Fig. 11.



Witnesses

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UNITED STATES PATENT OFFICE.

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MACHINE FOR GALVANIZING.

No. 914,827. Specification of Letters Patent. Patented March 9, 1909.

Application filed April 21, 1908. Serial No. 428,345.

To all whom it may concern:

Be it known that we, HUGH A. HALL and JOHN HERCKER, citizens of the United States, residing at Burlington, in the county of Burlington, State of New Jersey, have invented a new and useful Machine for Galvanizing, of which the following is a specification.

Our invention relates to improvements in galvanizing apparatus and consists of means for temporarily suspending the baskets or other receptacles in which the articles to be coated are placed, and of means for releasing said baskets in order that the latter with their contents may be immersed in the coating composition.

It also consists of means for conveying the baskets to pivoted arms whereby the latter may tilt said baskets and discharge their contents in a cooling device.

It also consists of means for removing the superfluous coating composition from the article placed in the baskets and of means for directing the latter to a position where they are placed in the path of the sprocket chains that convey said baskets through the coating composition which when desired may be heated.

It further consists of means for removing the coated articles from the cooling device and discharging them in a suitable receptacle.

Figure 1 is a side elevation of the apparatus, partly in section. Fig. 2 is a side elevation of certain detached portions of the device. Fig. 3 is a perspective view of one of the baskets or receptacles employed and in which the articles to be coated are placed. Fig. 4 is a plan view of certain of the parts seen in Fig. 1. Figs. 5 and 6 are views of opposite ends of certain portions of the apparatus. Fig. 7 is a side elevation of certain portions of the apparatus. Fig. 8 is a perspective view of a detached portion of the apparatus. Fig. 9 is a side elevation of a clutch employed. Fig. 10 is a plan view of the clutch seen in Fig. 9. Fig. 11 is a longitudinal vertical section of a pair of clutches employed.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—1 designates a furnace upon which is supported a trough 2 in which latter is placed the composition 3 to be applied to the articles to be coated. Supported above the trough 2 are the sprocket wheels 4 fast on the shafts 5 journaled in the supports 5^a, it being understood that said sprocket wheels 4 are adapted to impart motion to the sprocket chains 6 that engage therewith and are provided with the projecting members or fingers 7 for a purpose hereinafter described. The supports or standards 5^a are braced by the bars 8 whose outer ends are inclined as at 9, in the left hand portion of Fig. 1, it being noted that the opposite ends of said bars 8 are each provided with a depression 10 adjacent the inner extremities of the inclined arms 11, in the right hand portion of Fig. 1, it being further noted that said arms 11 are pivoted at 12 to any convenient fixed point, in the present instance, in the end portions of the brace bar 8.

13 designates standards in which is journaled a shaft 14 to which is secured the hand wheel 15 whereby said shaft may be rotated when desired, it being noted that the latter is provided with a counterbalance 16 and the projecting members 17, as best seen in Figs. 1, 2 and 7 and for a purpose hereinafter described. The standards 13, in the present instance, are adjacent the inclined bars or rails 18 that lead to the horizontal ways 19 which are formed with the curved portions 20 as best seen in Figs. 1 and 7, and for a purpose hereinafter described. The curved portions 20 lead to the inclined surfaces 21, that are in alinement with the upper surfaces 22 in the members 23 of the arms or levers 24 when the latter are in their normal positions as seen in Fig. 1. The portions 25 of the arms 24 adjacent the portions 23 thereof are in the form of hooks as best seen in Figs. 1, 4 and 7. The arms 24 project from a sleeve 26 loosely fitted on a shaft 27 journaled in the supports or standards 28. The sleeve 26 has secured thereon, the hand wheel 29 whereby said sleeve 26 may be rotated when desired. The sleeve 26 has secured thereon, a clutch member 30 adapted to co-act with the clutch member 31 loosely fitted on the collar 26, as best seen in Fig. 4, it being noted that said clutch member 31 is provided with an arm 32 whose outer extremity is formed with a socket 33, see also Figs. 1, 8 and 9, in which is located the spherical portion 34 of the rod 35 whereby a ball and socket connection exists between said arm 32 and the

rod 35, it being noted that a nut 36 is employed to retain the sphere or ball 34 in proper position within the socket 33. The lower extremity of the rod 35 is connected to the strap 37 of an eccentric 38 fast on a shaft 39 to which motion may be imparted in any well known manner, as for instance by an engine, dynamo, etc. The shaft 39 has fitted thereon, a sleeve 40, see Figs. 1 and 7, that is adapted to be rotated by said shaft 39 while at the same time said sleeve may be shifted on the shaft 39 and in the direction of its length for a purpose hereinafter described. The sleeve 40 is provided with the clutch members 41 and 42, the former of which is adapted to co-act with a clutch member 43 in a pulley 44 loose on the shaft 39, while the clutch member 42 co-acts with a clutch member 45 in a pulley 46 loose on the shaft 39.

47 designates a belt that passes partly around the pulleys 44 and 48, the latter being fast on the shaft 49 that is journaled in pillow blocks 50, it being noted that said shaft 49 has fast thereon, a bevel pinion 51 that meshes with a bevel gear wheel 52 fast on a shaft 53, journaled in the standard 54, and having secured thereon, a worm 55 that engages the worm wheel 56 fast on the shaft 5, whereby when motion is imparted to said worm wheel 56, the sprocket wheels 4 are caused to turn in unison therewith.

The pulley 46 has secured thereto, one end of a belt or cord 57 whose opposite end is secured to a pulley 58 fast on the shaft 59 journaled in standards 60, it being noted that said shaft 59 has fast thereon, the pulleys 61 and to each of which latter is secured the end of a chain, cord, etc. 62, the opposite ends of which are secured at 63 to a pan 64 hinged at 65 to a trough 66 to which latter water is supplied through the pipe 67, as seen in Fig. 4. The trough 66 is provided with a discharge pipe 68. The pan 64 is provided with perforations 69 to permit the water 70 to escape from said pan when the latter is in its elevated position, as indicated in dotted lines in the right hand portion of Fig. 1.

The sleeve 40 is provided with a grooved collar 71 that moves in unison therewith and is engaged by the free end 72 of a lever 73 fulcrumed to some convenient fixed point as at 74, said arm having pivoted thereto one end of a link 75 whose opposite end is pivoted at 76 to one end of a lever 77 fulcrumed at 78 in a standard 79. The lever 77 is provided with a locking device 80 whereby the former may be retained in one or the other of the three positions it may occupy, for a purpose hereinafter described.

81 designates a rod, one end of which is pivoted at 82 to the lever 77 while its opposite end is pivoted at 83 to the lever 84 fulcrumed at 85 to a standard 86, said lever 84 being provided with a locking device 87 similar to the locking device 80. The locking devices 80 and 87 can be rendered inoperative when desired by means of the catches 96 and 97 carried by their respective levers.

88 designates receptacles or baskets provided with perforations 89 and the handles 90 and 91, the latter of which is provided with a head or enlarged portion 92 adapted to travel in the groove 93 in the rails 18 and ways 19 whereby said baskets 88 are properly guided when acted upon by the sprocket chain 6.

The operation of the device is as follows:— A receptacle 88 is placed in the device by locating the handles 90 and 91 upon the projecting members 17, it being understood that there are two of these latter, as seen in Fig. 8, one of which supports the arm 90, while the other supports the arm 91, see Fig. 1. The receptacle 88 thus supported is supplied with the articles to be galvanized or otherwise coated. The operator adjacent the hand wheel 15 turns the latter in the direction indicated by the arrow *a* in Fig. 1, whereupon the members 17 are brought into the position seen in Fig. 2, thereby permitting the handles 90 and 91 to slide down the rails 18 and rest upon the ways 19 thereby causing said receptacle 88 and its contents to sink into the molten coating material or composition 38, after which the operator returns the hand wheel 15 and consequently the projecting members 17 to their normal positions as seen in Fig. 1. The operator then throws the lever 84 from left to right, see Fig. 7, whereupon the lever 77 is caused to move in unison with the lever 84 by reason of the connecting rod or link 81. It will thus be seen that a pull is exerted upon the link 75 thereby turning the arm or lever 73 upon its pivot 74 thereby shifting collar 40 from right to left and causing the clutch member 41 to engage the clutch member 43 and thus impart motion to the pulley 44, it being assumed that the shaft 39 is rotating. The motion of the pulley 44 transmits motion to the pulley 48 by reason of the belt 47, whereupon the shaft 49 and the bevel pinion 51 fast thereon are caused to rotate in unison. The rotary motion of the pinion 51 imparts motion to the bevel gear wheel 52 and consequently to the shaft 53, the worm 55, the worm wheel 56, its shaft 5 and sprocket wheels 4 fast thereon, said sprocket wheels 4 imparting motion to the sprocket chains 6 and the fingers 7 thereon, thereby causing the latter to travel in the direction indicated by the arrow *b* in Fig. 1, it being understood that said fingers 7 are brought against the handles 90 and 91 of the receptacles 88, that lie in their path as illustrated in Fig. 1.

It is apparent that each receptacle 88 is placed in the device in the manner hereinbefore described and that the clutch members

41 and 43 are disengaged so as to bring the sprocket chain 6 to a stop each time a receptacle 88 is placed in the device.

The receptacles 88 and their contents are carried through the coating composition 3 and when the handles 90 and 91 reach the curved portions 20 they are guided thereby to the inclined surfaces 21 and slide down the latter and drop into the hook portions 25 of the arms 24 as seen in Fig. 1, the sprocket chains being again brought to a stop by shifting the clutch member 41. The operator adjacent the hand wheel 29 now operates the handle 94, see Figs. 4 and 5, whereupon the clutch member 31 is brought into engagement with the clutch member 30 whereupon the rocking motion of the shaft 27 is transmitted to the arms 24 and receptacle 88 suspended thereon, whereby the superfluous coating composition is shaken off the articles within said receptacle.

It is to be understood that the shaft 39 and the eccentric 38 thereon, as also the eccentric rod 35, the arm 32 and the shaft 27 and sleeve 40 are in constant motion, when the machine is in use and that the arms 24 are rocked only when the clutch members 30 and 31 are interlocked as hereinbefore described.

When the removal of the superfluous coating material is accomplished, the operator adjacent the hand wheel 29 turns the latter in the direction indicated by the arrow *c* in Fig. 1 whereupon the arms 24 and the receptacle 88 suspended thereon are moved from the positions seen in said Fig. 1 into those seen in Fig. 7, it being noted that the receptacle 88 is now in a position to discharge its contents into a chute 95 that directs said contents to the pan 64 so that the coated or galvanized articles may be cooled by the water in the trough 66, after which the pan 64 is tilted or brought from the position seen in full lines in Fig. 1 to that seen in dotted lines in said figure so as to discharge the cooled articles into a suitable receptacle.

The tilting of the pan 64 is accomplished by throwing the lever 77 to the left of its position seen in Fig. 7 whereupon the clutch member 42 is caused to engage the clutch member 45 thus imparting motion to the pulley 46 and consequently to the cord 57, the pulley 58, the shaft 59 and pulley 61 fast thereon, whereupon a pull is exerted on the cord 62 causing the latter to turn the pan 64 on its hinges 65. When the clutch members 42 and 45 are disengaged, by the operation of the lever 77, the pan 64 returns to its normal position by gravity.

It will be noted on referring to Fig. 1, that when the hand wheel 29 is turned in the direction indicated by the arrow *c*, it causes the receptacle 88 suspended from the arms 24 to travel in the direction indicated by the arrow *d*, whereupon it will be seen that the handles 90 and 91 pass under the arms 11 and cause the latter to turn on their pivot 12 into the position indicated in dotted lines. As soon as the handles 90 and 91 reach a point beyond the extremities of the arms 11, the latter drop into their normal positions seen in full lines in Fig. 1, so that when said receptacle 88 is moved from the position seen in Fig. 7 and in the direction indicated by the arrow *e*, the handles 90 and 91 are caused to engage the upper surfaces of the arms 11 and be directed thereby to the depressions 10 in the bars 8 whereupon said handles 90 and 91 are in the path of the fingers 7 so as to be carried by the latter to their original or initial positions on the projecting members 17 and thus retain the receptacle 88 in the proper position to be again supplied with articles to be galvanized or coated as hereinbefore described.

While I have shown in the drawings a machine which I know in practice operates successfully, it will be evident that various changes may be made therein and other instrumentalities may be used which will operate satisfactorily, and I therefore do not desire to be limited in every instance to the exact form as herein shown and described, but desire to make such changes within the scope of the claims as may be necessary.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, a carrying mechanism located above said trough, inclined guides at opposite ends of said trough, an article carrier, means for controlling the passage thereof along one of said inclined guides, said carrier being adapted to be moved through said trough by said carrying mechanism, and a receiving mechanism adapted to receive the article carrier after passing from said trough.

2. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, a carrying mechanism located above said trough, article carriers adapted to be passed through said trough by said carrying mechanism, and means for emptying an article carrier after passing through said trough and for returning said carrier into the path of said carrying mechanism.

3. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, a carrying mechanism located above said trough, article carriers adapted to be moved through said trough by said carrying mechanism, means for emptying an article carrier after it passes through said trough and for automatically returning the same to said carrying mechanism, a fluid tank, and a container

located therein adapted to receive the articles discharged from said article carrier.

4. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, a carrying mechanism located above said trough, article carriers adapted to be moved through said trough by said carrying mechanism, means for emptying an article carrier after it passes through said trough and for automatically returning the same to said carrying mechanism, a second fluid tank, a container located therein adapted to receive the articles discharged from said article carrier, and means for emptying said container.

5. In a device of the character named, a furnace, a trough heated thereby, adapted to contain a coating composition, and provided with guides, article carriers adapted to engage said guides, means for passing said carriers into said trough, and carrying mechanism for moving said carriers through said trough, a receiving device to which the carriers pass from said carrying mechanism, a cooling device, a container located therein and adapted to receive the articles from said carrying device, and means for actuating said container.

6. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, guides on said trough, inclined guides at each end leading to said first-guides, a series of article carriers adapted to engage said guides, means for controlling the passage of article carriers to one of said inclined guides, a carrying mechanism adapted to pass the article carriers through said trough and up the other of said inclined guides, a receiving device adapted to receive an article carrier as it passes from said carrying mechanism, means for discharging the articles from said carrier and for returning said carrier into the path of said carrying mechanism, a cooling device, a container therein, and means for causing the articles passing from said receiving device to empty into said container.

7. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, longitudinally extending guides on said trough, article carriers adapted to engage said guides, receiving and discharging guides leading to said longitudinal guides, means for controlling the passage of an article carrier to said receiving guides, a carrying mechanism for passing articles along said guides and up said discharging guides, a receiving device to which said article carriers pass from said last mentioned guides, means for actuating said device to empty the articles contained in said article carrier, a cooling tank, a container therein adapted to receive articles discharged from said receiving device, and means for emptying said container.

8. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, a carrying mechanism located above said trough and provided with fingers, article carriers having handles with which said fingers are adapted to engage, a receiving device to which said carriers are automatically discharged from said carrying mechanism, a cooling tank, a container therein, means for actuating said receiving device, and means for actuating said container.

9. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, guides on said trough, inclined guide-ways leading to said guides, article carriers adapted to engage said guides and guide-ways, a carrying mechanism adapted to move said article carriers through said trough, a rock shaft, arms fixed thereon to which the article carriers are discharged from said trough, and means for rocking said shaft.

10. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, sprocket wheels located above said trough, sprocket chains engaging said wheels, a series of article carriers, means carried by said chains for engaging said carriers to move the latter through said trough, driving means for said sprocket wheels, and a receiving device adapted to discharge the articles from a carrier and to return said carrier into the path of said carrying mechanism.

11. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, sprocket wheels located above said trough, sprocket chains engaging said wheels, a worm wheel on the shaft of one of the sprocket wheels, driving means for said worm, a series of article carriers adapted to be actuated by said chains, means for supporting the article carriers while passing through the trough, and inclined guides located at the discharge end of the trough for guiding the article carriers therefrom.

12. In a device of the character named, a trough, a carrying mechanism located thereabove, a rock shaft adjacent said carrying mechanism, guide members carried by said rock shaft and adapted to abut against said trough to produce a continuous track therefrom, article carriers adapted to engage said track and be supported by said members, and means for rocking said shaft.

13. In a device of the character named, a trough, a carrying mechanism located thereabove, a rock shaft adjacent said carrying mechanism, guide members carried by said rock shaft and adapted to abut against said trough to produce a continuous track therefrom, article carriers adapted to engage said track and be supported by said members,

and means for rocking said shaft and for causing the articles to be discharged from the carrier support by said members.

14. In a device of the character named, a trough, guides leading therefrom, a rock shaft mounted in proximity to said guides, supporting members carried by said rock shaft, actuating means for said rock shaft, an article carrier adapted to be supported on said guides and to be discharged therefrom on to said members, mechanism for moving said carrier through said trough, devices for emptying said carriers, and means for causing the return of an empty carrier to said mechanism.

15. In a device of the character named, a trough, article carriers arranged to pass through the trough, means for guiding the article carriers during their passage through the trough, inclined guides leading from said means, a rock shaft, arms loosely mounted thereon and provided with hooks arranged to receive the article carriers from said inclined guides, and means for actuating the arms.

16. In a device of the character named, a rock shaft, a sleeve loosely mounted thereon, arms fast on said sleeve, a clutch member fast on the rock shaft, a clutch member fast on the sleeve adapted to coact with said first clutch member, and means for imparting motion to said rock shaft.

17. In a device of the character named, a rock shaft, a clutch member fast thereon, an arm projecting from said clutch member, a connecting rod operatively connected with said arm, means for actuating said rod, a sleeve loosely mounted on said rock shaft, arms fast on said sleeve, a clutch member fast on said sleeve and adapted to engage the clutch member fast on the rock shaft, and means for causing the engagement and disengagement of said clutch members.

18. In a device of the character named, a rock shaft, a sleeve loose thereon, stationary guides, arms projecting from said sleeve and forming, when in normal position, a continuation of said guides, actuating means for said sleeve, and means for actuating said rock shaft.

19. In a device of the character named, a trough, article carriers, means for passing the same through the trough, a second trough, a container hinged to the latter, means to which the article carriers are fed from said passing means for causing said carriers to discharge their contents into said container, a cable connected with said container, a pulley mounted above said container and with which said cable engages, and actuating means for said cable.

20. In a device of the character named, a trough, article carriers, means for passing the same through the trough, a second trough, a container hinged to the latter, means to which the carriers are fed from said passing means for causing said carriers to discharge their contents into said container, a pulley mounted above said container, a main shaft, a pulley loose thereon, and provided with a clutch member, a clutch member non-rotatable mounted on said main shaft but having longitudinal movement thereon, and a connection secured to said loose pulley and said container and passing around said pulley.

21. In a device of the character named, a furnace, a trough heated thereby and adapted to contain a coating composition, guides carried by said trough and having a groove, an article carrier having a handle adapted to engage said groove, means for moving said carrier through said trough, a receiving device to which said carrier is discharged, and means for actuating said device to discharge the articles from said carrier.

22. In a device of the character named, a furnace, a trough heated thereby and adapted to contan a coating composition, an inclined guide leading from said trough, a series of article carriers having handles, mechanism for passing said article carriers through said trough and along said guides, said guides having inclined faces, a rock shaft, a sleeve loosely mounted thereon, arms carried by said sleeve having hooks normally in alinement with the outer ends of said faces, means for rotating said sleeve, and levers suitably pivoted to which said carriers are discharged from said arms and guided into the path of said carrying mechanism.

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