D. H. MURPHY.

APPARATUS FOR ELECTROPLATING PIPES.

APPLICATION FILED JULY 8, 1912.

1,079,427.

Patented Nov. 25, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

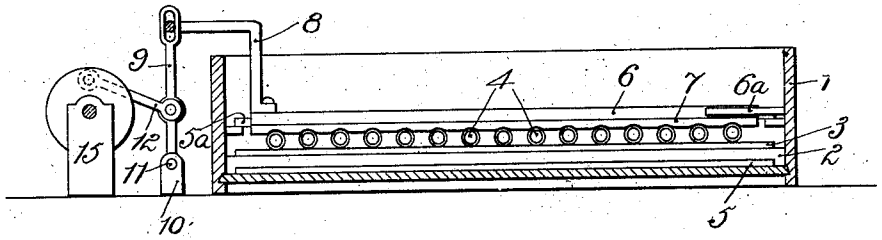
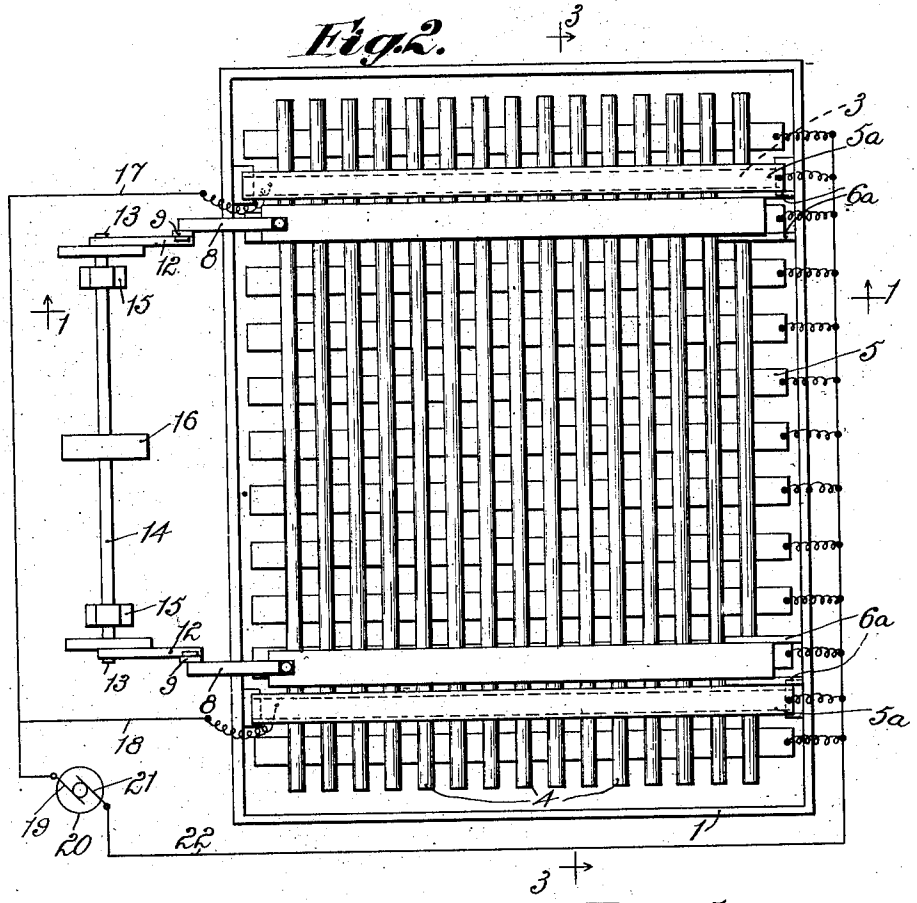


Fig. 2.



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2 SHEETS—SHEET 2.

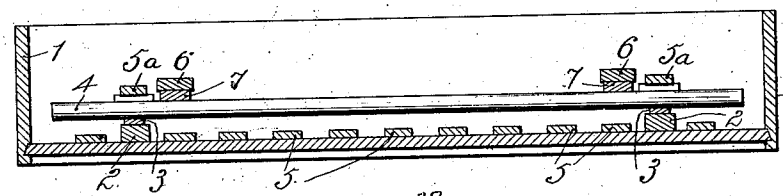


Fig. 3.

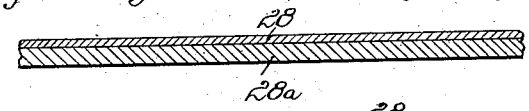


Fig. 6.

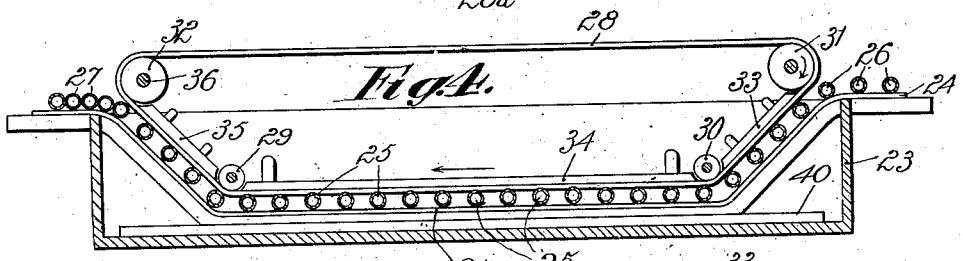


Fig. 4.

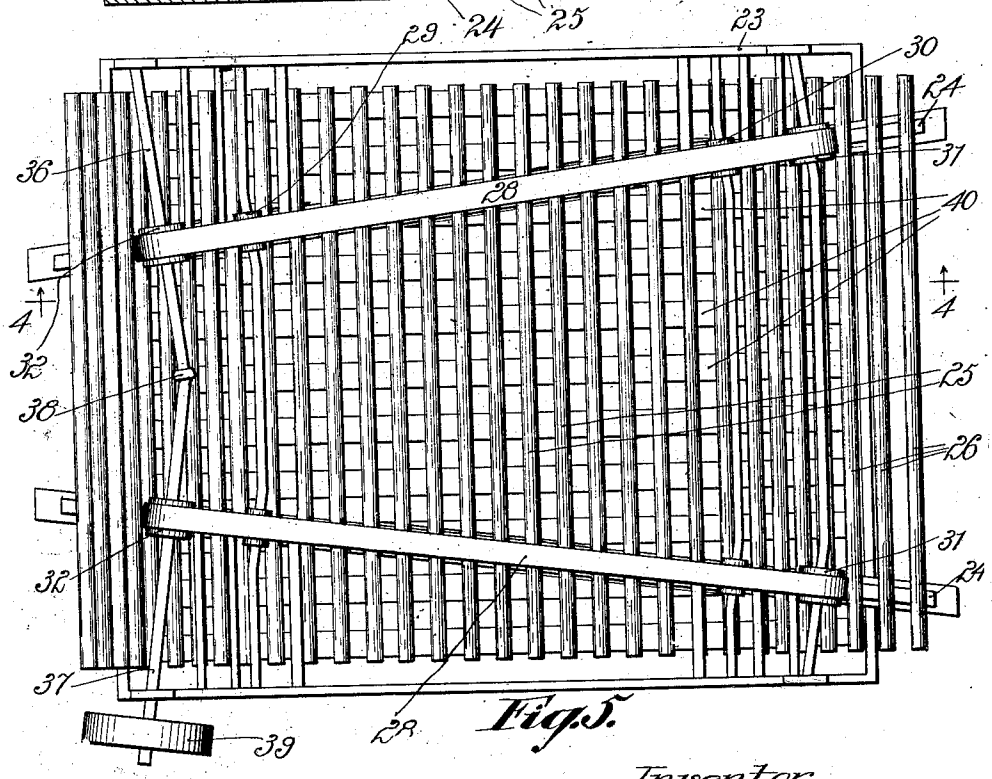


Fig. 5.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR ELECTROPLATING PIPES.

1,079,427. Specification of Letters Patent. Patented Nov. 25, 1913.

Application filed July 8, 1912. Serial No. 708,097.

To all whom it may concern:

Be it known that I, DANIEL H. MURPHY, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Electroplating Pipes, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improved apparatus for electroplating rods or pipe, by which the rods or pipe being treated are moved positively in the plating solution so that all portions of the surface of the rods or pipe are presented uniformly for the electrolytic operation. By my invention, the operation may either be intermittent or continuous and, while the apparatus is somewhat different for the continuous operation from what it is for the intermittent operation, the essential constructional features characterizing my invention are involved in both arrangements.

It will be understood that while I shall refer throughout the specification and claims to the plating of pipes by means of my apparatus, I wish to have it understood that the apparatus will handle equally well solid rods and, furthermore, that the rods or pipe may have any desired cross-section as long as they may be made to roll upon supporting surfaces.

An essential feature of my present invention consists in providing a support for the pipes upon which they may rest and be rolled so as to present the surface of the pipes uniformly to the plating operation and, in combination with such a supporting surface, an operating member having a yielding surface in engagement with the upper surfaces of the pipes so that, by movement of said member, the pipes are positively rotated in the plating solution.

The several drawings illustrating my invention are as follows:

Figure 1 shows in cross-section, taken along the line 1—1 in Fig. 2, a plating tank in which the parts are arranged for intermittent plating of successive lots of pipes. Fig. 2 shows in top view the mechanism illustrated in Fig. 1. Fig. 3 is a longitudinal sectional view of the parts shown in Figs. 1 and 2, taken along the line 3—3 in Fig. 2. Fig. 4 shows in transverse sectional view a modified form of plating tank in which the operation is continuous, such view being taken along the line 4—4 in Fig. 5. Fig. 5 shows in top view the mechanism illustrated in Fig. 4. Fig. 6 is a detail sectional view of the conveyer belt employed in connection with the mechanism shown in Figs. 4 and 5.

Similar numerals refer to similar parts throughout the several views.

As shown in Figs. 1, 2 and 3, the tank 1 contains transverse supporting members 2, preferably of wood, upon which the conductors 3 are located. The conductors 3 form supports for the pipes 4, which supports are substantially horizontal. A plurality of anodes 5 are disposed in the bottom of the tank so as to give proper distribution of the metal to be deposited throughout the solution in the tank 1. The pipes 4 are engaged upon their upper surface by operating members 6, which have secured to their lower surface strips of resilient material 7, as, for example, felt, india rubber, or similar material, which yields somewhat as it engages the pipes and thus permits positive engagement with all of the pipes in the tank. The members 6 have formed on their left hand ends, as shown in Figs. 1 and 2, brackets 8 which are engaged on their outer ends by levers 9 pivoted to supporting brackets 10 at 11. The levers 9 are connected by connecting rods 12 with the cranks 13 secured to the shaft 14 supported in suitable bearings 15. The shaft 14 is provided with a pulley 16, by which it is rotated in order to reciprocate the members 6 and thus oscillate the pipes 4 in the tank. The ends of the operating members 6 opposite to the brackets 8 are engaged by the guides 6^a to keep the operating members in proper position upon the pipes 4. The conductors 3, which are preferably of copper, are connected together by wires 17 and 18 with one brush 19 of a plating generator 20, the other brush 21 of which is connected by wire 22 with all of the anodes 5 employed in the tank. Extra anodes as shown at 5^a are provided above the pipes over the conductors 3 to make more uniform the distribution of the plating operation, which otherwise might be somewhat less, adjacent to the contact surfaces

between the pipes and the conductors 3. The tank 1 is filled to a sufficient depth with plating solution so as to cover the anodes 5ª, and the pipes are oscillated a sufficient length of time to receive the desired thickness of coating which may be of any desired material, usually copper or zinc.

In the modification shown in Figs. 4, 5 and 6, the tank 23 is so conformed that the conductors 24 forming the supports for the pipes 25 are at their ends above the top of the tank 23 and at each end are bent so as to form inclined run-ways down into the tank, with level portions of the conductors across the bottom of the tank, thus affording supports for the pipes as they are about to enter the tank, as shown at 26, for subsequently leading the pipes down into the tank and across the bottom thereof and for afterward running the pipes up out of the tank to the position indicated at 27 after the plating operation has been completed. The pipes 25 are engaged during their progress through the tank by flexible belts 28, which may be of canvas or rubber, and provided on their outer surface with a resilient layer of soft rubber, felt, or similar material, which is slightly compressed by engagement with the pipes, and thus positively engages them to move them through the tank. The belts 28 are supported by guide wheels 29, 30 and 31 and pass over driving pulleys 32 so that the belts will take a position substantially parallel with the conductor supports 24. Backing plates 33, 34 and 35 are provided in the tank for securely holding the belt in engagement with the pipes between the guide wheels. Suitable means may be provided for adjusting the distance between the supports 24 and the belts 28 so that different sizes of pipe may be engaged and moved through the tank thereby, such means not being shown in detail herein. The driving pulleys 32, 32 are mounted upon the shafts 36 and 37, connected together at 38 by a universal joint, said shafts being driven by a pulley 39 from any suitable source of power, not shown. The belts 28 are disposed obliquely in the tank 23 and at an angle to each other, as indicated, so that different parts of the pipes are engaged thereby as they are moved through the tank, as a result of which no particular part of the pipe is protected unduly from the plating operation by engagement with the conductor supports 24 and the belts 28. Furthermore, by the inclination of the belts 28 in opposite directions, the resultant side thrust upon the pipes as they pass through the tank are balanced and thus the motion of the pipes through the tank is without displacement toward one side or the other of the tank. In this modification, the anodes are located at 40 in the bottom of the tank and in practice electrical connections are made with the anodes 40 and the conductor supports 24 in a manner similar to that shown and described in connection with the structure shown in Figs. 1 and 2. The tank 23 may be made of such a length that a single passage through it by the pipes 25 will give them a sufficient thickness of deposited metal or, if desired, the pipes may be run through the tank a number of times, or successively through several similar tanks so as to use different plating conditions as desired at different points in the process. The speed of the belts 28 may be varied as desired to change the length of time during which the plating operation continues in the tank 23 upon any given pipe 25.

While I have shown my invention in the particular embodiments herein described, I do not desire to limit myself to these constructions, as I may use many equivalents without departing from the spirit of my invention.

What I claim is:

1. In an apparatus for electroplating pipes, the combination of a tank for holding the plating solution, conductor supports conformed to lead pipes into the tank at one end and across the bottom thereof and out of the tank at its opposite end, and operating members having resilient surfaces in engagement with the pipes for moving them through the tank and delivering them therefrom, said operating members occupying inclined positions across the tank.

2. In an apparatus for electroplating pipes, the combination of a tank for holding the plating solution, conductor supports conformed to lead pipes into the tank at one end and across the bottom thereof and out of the tank at its opposite end, and operating members having resilient surfaces in engagement with the pipes for moving them through the tank and delivering them therefrom, said operating members being oppositely inclined across the tank to prevent longitudinal motion of the pipes in the tank.

3. In an apparatus for electroplating pipes, the combination of a tank for holding the plating solution, conductor supports conformed to lead the pipes into the tank at one end and across the bottom thereof and out of the tank at its opposite end, operating members having resilient surfaces in engagement with the pipes for moving them through the tank and delivering them therefrom, said operating members occupying inclined positions across the tank, and means for moving the operating members continuously in the same direction.

4. In an apparatus for electroplating pipes, the combination of a tank for holding the plating solution, conductor supports conformed to lead the pipes into the tank at one end and across the bottom thereof and out of the tank at its opposite end, op-

erating members having resilient surfaces in engagement with the pipes for moving them through the tank and delivering them therefrom, said operating members being oppositely inclined across the tank to prevent longitudinal motion of the pipes in the tank, and means for moving the operating members continuously in the same direction.

5. In an apparatus for electroplating pipes, the combination of a tank for containing the plating solution, an operating member presenting a surface of readily compressible material for simultaneously and positively engaging the topmost surfaces of a plurality of pipes, a conductor support in the tank for the pipes to be plated, an anode in the tank, and devices connected with the operating member for moving it to rotate the pipes.

In witness whereof, I hereunto subscribe my name this 2nd day of July, A. D., 1912.

DANIEL H. MURPHY.

Witnesses:
G. M. STEWART,
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