UNITED STATES PATENT OFFICE.

WILLIAM ANTHONY SHAW, OF NEW YORK, N. Y.

IMPROVEMENT IN METAL PLATING OR COATING TIN PIPES OR TUBES.

Specification forming part of Letters Patent No. **153,726**, dated August 4, 1874; application filed July 27, 1874.

To all whom it may concern:

Be it known that I, WILLIAM ANTHONY SHAW, of the city, county, and State of New York, have invented certain new and useful Improvements in Metal Plating or Coating Tin Pipe, of which the following is a specification:

It is my object to produce metallic pipe or tubing, consisting of a main foundation-pipe of tin or its alloys, plated or coated with copper, brass, or other metals.

To carry into effect my invention I proceed as follows: I first make a foundation-pipe of tin or its alloys by any of the well-known processes. Such pipe may have ribs upon its exterior to impart greater stiffness, or it may be grooved longitudinally, the grooves to be afterward filled up wholly or partially by a stronger metal in the subsequent process of deposition. The foundation-pipe is then placed in a depositing-bath, either rolled into coils with closed ends or in lengths straight or curved. The ends may be left open, and openings made at intervals through the walls of the pipe, in order to allow plating on the inside thereof. These openings are afterward closed by means of the electro-galvanic process, or soldered or closed by any convenient method. Such openings allow the escape of gas formed during the operation of plating. These openings may be used to pass the battery or anode connections through to inside of tube, and also for access and circulation of solution. The pipes thus prepared and arranged are to be plated with lead, copper, brass, nickel, zinc, or other metal or alloys, either singly or in one or more successive layers, with either one or more different metals or alloys.

When the inside pipe is made of commercial tin, it may have chemically pure tin deposited upon its interior surface. Experience has proved that the most of the tin of commerce is unfit for linings for many purposes in the arts. The same is the case with other metals, and the same course of treatment may be followed with any of them.

The foundation-pipe may be wrapped or inclosed with strips or wires of copper, brass, iron, lead, or other metal, either one or more thereof, and finally have the exterior coated, consolidated, or soldered by means of electro deposition.

The pipes undergoing these operations may be annealed, and drawn through dies, or passed between rollers from time to time to render them more solid, and facilitate their manufacture.

The plating or depositing can be accomplished by magneto-electric machines, or simply by deposition without using either battery or machine.

The pipes made by these operations may have the ends thereof, or any desired portion, plated thicker than elsewhere, to re-enforce them where extra strength and thickness are required. This is effected by partially withdrawing the tubes from the bath, or by coating them in places with varnish or other material to prevent the deposition.

The depositing solution may be caused to circulate by any of the well-known means for that purpose, or by the application and withdrawal of heat. The battery or magneto-electric force may be worked with regular alternations of increased and diminished force or pulsations.

The advantages accruing from my invention are many. I produce tubes that will be perfectly safe and wholesome for soda-water, ale, mineral waters, and other purposes of similar nature. I also gain materially in economy of cost and in greater strength. The great objections to block-tin are its liability to external corrosion when laid on the ground, and of internal corrosion from certain waters and other fluids. There are also difficulties in its manipulation and in making joints by the usual methods. These are overcome by inclosing it in copper other metal, as described.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

As a new article of manufacture, pipe or tubing, composed of a foundation-pipe of tin or its alloys, plated with copper, brass, or other metals, as set forth.

In testimony whereof I have hereunto signed my name this 20th day of July, A. D. 1874.

WILLIAM ANTHONY SHAW.

Witnesses:

GEORGE OWEN,

WILLIAM RENORF.