The Electro-deposition of Tin.

The *English Mechanic* says: An improved process for coating articles, made of certain metals, with tin, by means of electricity, has been recently patented in England.

The inventor (Mr. J. E. Bingham) claims that he can coat and preserve iron, steel, brass, copper, nickel, lead, zinc, gold, platinum, and any of their alloys, or the alloys of manganese; and states that his improved method is specially applicable to the prevention of oxidization or tarnishing of silver surfaces exposed to atmospheric influences.

The inventor, in carrying out his improvements in the electro-deposition of tin, takes a given quantity of that metal, by preference in a pure state, although what is commercially known and sold as tin may be employed, which he dissolves in chlorhydric acid, and precipitates by means of a solution of crude potassic hydrate; the precipitated tin is then washed free from acid, after which a quantity of potassic hydrate and also of cyanide of potassium is added; the temperature is raised to a point just below that at which the solution boils; and when it has been thus heated, a quantity of solution of calcic hydrate is added.

In the solution thus obtained, sheets of tin and the articles to be coated with the same are suspended; the articles having been prepared in the usual manner. The tin and the articles to be coated are then connected with the battery in the usual manner, and the articles are retained a longer or shorter time in the solution according to the quantity or thickness of tin required to be deposited on their surface.

The quantity of ingredients may be varied, but the inventor uses with advantage a bath of the following composition: To ten gallons of water eight hundred and twenty-six grains of tin in solution, two and a half pounds of potassic hydrate, half a pound of cyanide of potassium, and one hundred grains of calcic hydrate are added. These proportions constantly vary according to the heat of the solution, the state of the electric current, and the quantity of metal dissolved and deposited. Thus a variation in the quantities of the several ingredients, will be caused, which can only be determined and altered by a practical operator, in accordance with the requirements of his solution.

In the event of the equilibrium of the solution not being maintained in so far as regards the heat, quantity of metal, electricity, or chemicals employed, the deposit obtained is liable to become rough, in which event the article should be taken out and brushed with wire brushes (as is usual in the manufacture of electro-plated articles) and again passed into the solution; and also in the case of large articles, the granular, soft, or surplus deposit must be removed by an ordinary brush, a cloth and sand, or by any other convenient method.

The solution may be made from several precipitates of tin, provided that potassic hydrate, cyanide of potassium, and calcic hydrate are added, and a similar result may be obtained by dissolving the tin into the solution by the aid of electricity.

THE Broom (*Sarothamnus scoparius*) is extremely abundant in Madeira, but is supposed to have been originally introduced to the island. It is now sown extensively on the mountains for the purpose of being cut down for firing, or burnt on the spot every five to seven years to fertilize the ground. The twigs and more slender branches are also used commonly as withs for binding bundles of faggots, brushwood, fern, etc.; and numbers of country people, especially young girls and children, residing within reach of Funchal, gain a livelihood by bringing daily into the town bundles of broom for use in heating ovens, etc. The fine and delicate basket-work peculiar to Madeira is manufactured from the slender peeled twigs of this plant. Mr. Lowe speaks of a variety with pure white flowers, which occurs on this island.

A LONG STRETCH OF WIRE.—The American Compound Telegraph Wire Company have just completed, for the Pacific and Atlantic Telegraph Company, a wire for crossing the Mississippi river at St. Louis, which requires a stretch of about a mile and a half in one piece. This wire weighs 220 pounds to the mile, and by actual test the breaking strain is 1,240 pounds, which is very much more than sufficient to guarantee it against fracture after suspension, either from its own weight or by any other means.

VAGARIES OF TYPOGRAPHY.—It is hardly necessary to notify our general readers that an egregious blunder was perpetrated in our last issue, by which the cut of "Baxter's Steam Engine" was inserted with the advertisement of the "Roper Caloric Engine," and *vice versâ*. The only apology we can make is to place each cut in its proper place in this present issue, and notify all our readers that "Baxter" is "Baxter," and "Roper" is "Roper."

Inventions Patented in England by Americans.

June 13 and 14, 1871.

[Compiled from the Commissioners of Patents' Journal.

CONSTRUCTION OF SHIPS.—W. G. Warden, Philadelphia, Pa.

GANG PLOW.—L. Chapman, Collinsville, Conn.

GOVERNOR FOR STEAM ENGINE.—H. B. Weaver, Hartford, Conn.

MOLD FOR GLASS BLOWING.—S. R. Bowle, New Bedford, Mass.

Foreign Patents.

The population of Great Britain is 31,000,000; of France, 37,000,000 Belgium, 5,000,000; Austria, 36,000,000; Prussia, 40,000,000; and Russia, 70,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, while business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. A large share of all the patents secured in foreign countries by Americans are obtained through our Agency. Address MUNN & Co., 37 Park Row, New York. Circulars, with full information on foreign patents, furnished free.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per Line will be charged.

Answers to Correspondents.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 1·00 a line, under the head of "Business and Personal."

ALL reference to back numbers must be by volume and page.

THE USE OF APERIENTS.—I am every year more dissatisfied with mankind; they want to know everything except what concerns them most. Just think of F. C. asking the question, in the SCIENTIFIC AMERICAN of June 24, "whether the habitual use of aperients is injurious." This is one of the wide roads to the grave. Let F. C., if he be one of those victims, gradually learn to do without aperients, and increase the quantity of his food, *sans increase of nourishment*, as much as he can. Volumes could be written in explanation, but I only lay down the principle. If F. C. keeps the principle always in view as long as he may live, he will thank the writer of this letter, before he is five years older.—J. M.

BELTS.—It is asked by one of your querists, "Why a belt will run to the largest part of a pulley?" If a ribbon be drawn tighter on one edge than the other, it will bow out, or become crowning on the tight edge, more particularly at the point taken hold of. It is the same with a belt. The large part of the pulley draws the belt tighter than the small part, and consequently changes its direction, at the point of its entering on the pulley.—S. G. D., of Pa.

DISSOLVING MICA.—In the column of queries, page 347, Vol. XXIV., M. asks if he can dissolve mica. He can do what will perhaps answer his purpose equally well. Grind mica fine, and mix to a proper consistency, with a solution of gum arabic, in water. It is sometimes used in this form as a substitute for silver ink.—J. E. W., of N.H.

CISTERN.—If E. E. H. will take the pains he will always have good cistern water. Let him construct the cistern so it will hold water to the top if necessary; cover it so no sweepings or washings can enter, and provide for good ventilation. If a pump be used, he should run the suction pipe no nearer the bottom than 18 inches. He must keep the gutters clear of leaves, otherwise he will have a filter of rotten leaves instead of charcoal. He should make the connection from the gutter to the cistern so it can be detached, and never allow the water to enter until the house roof and gutters are completely washed off by the rain. This rule I follow strictly, and clean out the cistern once a year. I always have good cistern water.—J. A. Mc., Ind.

POWER TO DRIVE CIRCULAR SAWS.—If E. A. M. wishes to know which of the two circular saws takes the least power, I will say the thin saw always; but the same saw will not be suitable for all kinds of work. The saw with sixty teeth will answer well for some work, but the saw with thirty teeth would not. Practice will soon tell him which is best. —J. A. Mc., Ind.

CASING OF STEAM PIPE.—B. L. C., who wants information as to casing a steam pipe, ought to be surprised if he ever works anything but warm water into his engine. Such an elaborate device for condensing his steam as a pipe 180 feet long, uncovered with any non-conducting material, is seldom seen. He will find that a covering of felt, or of the numerous boiler cements now made, will produce an immediate and great effect. But he should at once, if possible, place his boiler and his engine in close proximity, and then use all possible means to prevent the radiation of heat. He will not, then, be forced to diminish the pressure in his cylinder by keeping his cylinder cocks open.—D. B., of N. Y.

TO RESTORE BURNT CAST STEEL.—In your paper of June 17, A. T. L. asks for a recipe to restore burnt cast steel. Take 1½ pounds borax, ½ pound sal ammonica, ¼ pound prussiate of potash, 1 ounce rosin. Pound the above fine, add a gill each of water and alcohol. Put in an iron kettle, and boil until it becomes a paste. Do not boil too long, or it will become hard on cooling.—F. A. K., of Pa.

TELESCOPE.—In reply to E. T., I would say that the directions I gave were for a terrestrial telescope, which answers equally well for an astronomical one.

J. R., of N. J.—The pressure of steam in a boiler is exerted in all directions. The pressure of the water is transmitted in only one direction—downward. The pressure upward on the inner side of the top of the shell is that due to the expansive force of the steam. The pressure downward on the inner side of the bottom of the shell will be that due to the expansive force of the steam plus the weight of the water and the steam. The weight of the water and the steam is, however, received by the exterior supports upon which the boiler rests, so that practically there is on this account, very little if any more liability of the breaking of the shell at the bottom than at the top.

C. E. M.—The rule for finding the area of a circle, *i. e.*, multiplying the circumference by one fourth the diameter, depends for its approximation to exactness upon the exactness with which the circumference has been determined. As this is only attained approximately, of course the rule in question, although practically exact enough for all purposes, is theoretically imperfect. The problem of "squaring the circle" requires that the theoretically exact area shall be found.

A. E. S., of Mo.—In the oxychloride of zinc paint, the proportion of oxide of zinc used may be varied. It should, however, not be less than half the weight of the chloride. The object of the tartrate of potassa is to prevent too rapid drying. This may, therefore, be used in variable proportions. The amount of water and starch used depends upon the consistency required. Experience can be the only sure guide in these particulars. By a few preliminary experiments with small quantities you will probably be able to succeed.

S. —., of ——.—"Let well enough alone." If the iron pipe used does not rust, why should you wish a galvanized pipe? We have often expressed our disapproval of zinc coated iron pipes to convey water for culinary purposes. We believe them pernicious. We do not think burning an iron pipe in a wood fire would keep it from rusting in contact with water that would rust ordinary iron pipes.

A. G. X., of Ohio.—Glycerine and litharge stirred to a paste, hardens rapidly, and makes a suitable cement for iron upon iron, for two stone surfaces, and especially for fastening iron to stone. The cement is insoluble, and is not attacked by strong acids.

C. E. A., of R. I.—In your attempts to make a solution for electro-plating without a battery, you failed, probably through not using sufficient hyposulphite of soda. The recipe distinctly says, "a slight excess of the salt must be added."

C. B. P., of N. Y.—You can procure Haserick's "Secrets of Dyeing," of E. C. Haserick, Laconia, N.H.