Science and Art.

Zincing Iron.

Alex. Watt, editor of the electro-metallurgical department of the *London Chemist* has taken out a patent for the following method of covering steel and iron with a coating of zinc. He dissolves 12 1-2 lbs of the commercial cyanide of potassium in twenty gallons of rain water in a suitable vessel, and to this adds 5 lbs. of strong liquid ammonia. These are stirred together, and several large porous cells, like those employed in a Daniell's battery, are placed in it, and a strong solution—6 lbs. to the gallon—of the cyanide of potassium poured into each, until the hight of this solution is on a level with the ammonia cyanide liquor outside. Several pieces of copper are now attached to a copper wire connected to the negative pole of a galvanic battery—some of these pieces of copper are placed in each porous cell. Several pieces of zinc are now immersed in the solution outside of the cells, and they are connected by the copper wire to the positive pole of the battery, which is set into action and allowed to continue until three ounces of zinc to every gallon of the solution, has been dissolved from the pieces of zinc immersed in it. This amount can be found out by measuring the liquid and weighing the zinc before the latter is immersed. The porous cells are now removed, and a solution of carbonate of potassa (5 lbs.) is added to the zinc cyanide ammonia solution in the vessel. The bath is then stirred, and a white precipitate falls to its bottom. When this has subsided, the clear is poured off into another vessel, and is fit for use. The iron articles to be coated, are first plunged in a pickle composed of one lb. of sulphuric acid, and half a pound of muriatic (hydrochloric) acid in two gallons of water. This pickle removes the scale or oxyd; they are then rinsed in rain water, brushed with a hard brush and sand, and finally rinsed in soft water—all the oxyds must be removed, and no grease or sweat from the hands allowed on them. They are now placed in the zinc solution described, and connected in the well-known way, to the negative pole of a battery, when a zinc deposition on them begins at once. As soon as they are sufficiently coated, they are removed, rinsed in warm rain water and placed in dry saw dust to dry them. They are afterwards rendered bright by a scratch brush, or gently scouring with fine sand and a soft brush.

This is a more expensive and troublesome method of zincing iron than that commonly practiced, of dipping the cleaned iron into a solution of salammoniac, and from thence into a bath of molten zinc covered with ground glass, but it may be superior to it. The zinc is liable to go on unevenly by the molten bath process, whereas it will be very evenly deposited by the electrotype process described. Iron plates and other articles can be tinned by the electrotype process, by using a solution of the chloride of tin, such articles will take on a coat of molten zinc, (if dipped into it,) on the top of the tin.

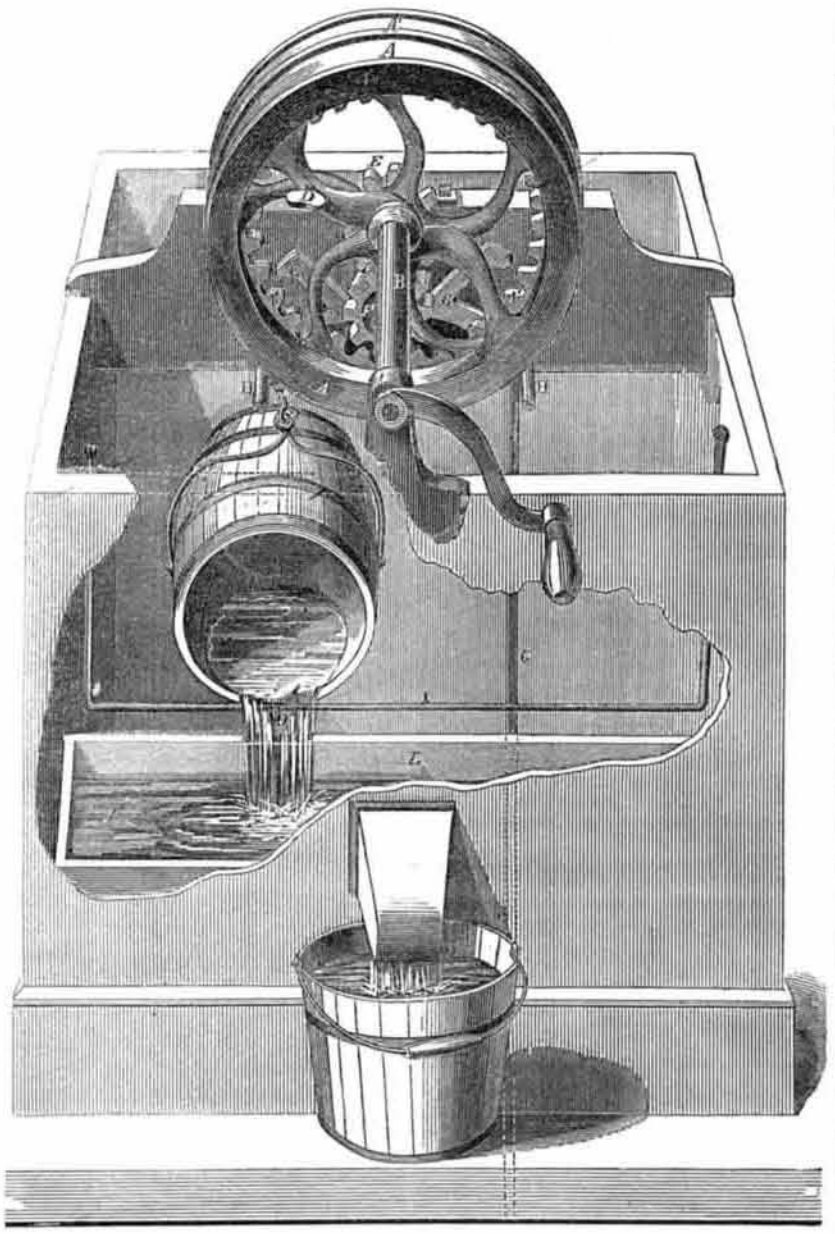
Silvering Metal.

A patent has lately been taken out in France by B. Adville, of Paris, for a new method of silvering iron or copper. The process consists in dissolving about three ounces and a quarter of pure silver in double the quantity of nitric acid, and adding to it two pounds of cyanuret of potassium dissolved in ten quarts of water. When well stirred, seven ounces of fine whiting in powder are added, well stirred, then allowed to settle. The metal articles to be silvered are placed in a bath of the clear of this liquor diluted with twice the quantity of soft water. When they have remained a sufficient time in it to be impregnated (which can be known by examining them,) they are taken out rubbed with dry whiting, washed and then rubbed with a dry cloth, when they assume a brilliant white appearance. The articles to be silverized in this manner, must be well cleaned before they are placed in the bath; no oxyd or grease must be allowed to remain on a single spot. When a new batch of articles are be silvered, the bath has to be strengthened by adding a fresh quantity of the cyanuret silver solution. The process is very simple, and is stated to be as effective as silvering by the use of a battery; if so it is a valuable improvement.

To Detect Photographic Bank Notes.

Make a saturated solution of the cyanate of potassium in soft water, and apply it with a pen or camel's hair pencil to the surface of the suspected bill. If genuine, the solution will have no effect upon it, but if a photograph, all the dark apparently printed part touched by the cyanate, is immediately decomposed, and the paper returns to its original whiteness.

NEW WATER ELEVATOR.



New Water Elevator.

Our engraving shows an improvement, the object of which is to afford an easy means of raising water, besides causing the buckets to fill and empty themselves, permit the use of one or two buckets, at pleasure, etc.

A A′ are too pulley wheels with grooved peripheries, on which the bucket ropes, C wind. Pulleys, A A′, are both placed on shaft, B, but they are loose upon it, and are also separate from each other. They are revolved by means of pinion, E, which is firmly attached to shaft B. This pinion, E, gears with another pinion, F, which meshes with a series of teeth located on the inside of pulley A′. When the crank is turned, shaft B acts through the pinions, E F, on the cogged teeth of A′, and causes it to revolve.

When it is desired to use both buckets simultaneously, one to rise, full of water, and the other, empty, to descend, the two pulleys are connected together by thumb screw, D, so that when A′ revolves A will also turn. But when it is desired to use only one bucket, the thumb screw, D, is withdrawn, and then A, being loose on shaft, B, and separate from A′, will not turn. This is a very quick and convenient mode of disconnecting the action of the pulleys.

G G are pawls, which alternately catch in the cogged teeth of A′, and prevent the latter from revolving, except in the proper direction, hold it in any given position, etc. One of the pawls is always engaged with the teeth of A′. The pawls, G, are connected with pins, H, which are so located that the bails of the buckets, when they come up, will strike their respective pins, H, and shift the pawls, throwing out the one that had been locked with A during the rise of the bucket, and causing the other pawl to lock. This permits the shaft B, to be revolved in a contrary direction, so as to return the bucket just raised to the well, and at the same time to lift the other bucket.

The buckets are emptied by means of a projecting pin, J, on the buckets, which catches under the cross rod, I, as the buckets rise, and cause them to tip over and pour their contents into trough L.

For further information address the inventor, H. B. Barker, Scott, Courtlandt Co., N Y. Patented July 8th, 1856.

Malachite.

This is a copper ore much prized in the ornamental arts. It is a peculiar variety of the green carbonate of copper, and is found in a number of localities, but perfect crystals are very rare. It usually accompanies other copper ores, and forms incrustations which, when thick, have the colors banded, and extremely delicate in their shades and blending. The copper mine of Cheshire, Conn., has produced handsome specimens, so have some of the copper mines of New Jersey, but the mines of Siberia are the most distinguished for large and fine specimens, and at the World's Fair, in London, the Russian Department was the admiration of all visitors, because of the numerous articles of ornamental malachite displayed. A pair of malachite doors, 14 feet high and 7 feet broad were much extolled. The mineral formed the veneering, one-fourth of an inch thick, built upon a frame of metal. The pieces were most tastefully arranged, and produced a fine effect. Thirty men were employed a whole year in cutting, fitting, and polishing the pieces, and the work went on, day and night, from May, 1850, to May, 1851. A fine chimney piece and numerous vases o the same material were grouped together, the whole being valued at $90,000.

In St Petersburg there is a large manufactory of malachite ornaments. The pieces—generally of only a few pounds weight—are first sawn into thin plates, with revolving metal disks, sand and water being fed into the slit, in the same manner that fine marble is cut. The curved pieces of this mineral are cut by bent saws, the management of which is very difficult.

The workman cuts his veneers according to the shades and veins of the mineral, so as to produce the best effect when all the pieces are fitted into the finished article. The edges of the pieces are ground quite smooth by revolving copper wheels, like those which our jewelers employ. The pieces are united with a cement colored with malachite powder, and when all fitted into a frame, the entire surface is ground and polished. The price of the finest specimens of malachite is about three dollars per pound. It receives a high polish, and is used for ear-rings, snuff-boxes, and other ornamental articles; but although it is so beautiful, owing to its delicate shadings of color, it is not much esteemed by jewelers, because it is so brittle, and difficult to work; it is sometimes passed off in jewelry for torquois, but it is inferior in hardness to this precious stone.

In the Palace of Versailles, Paris, there is one room furnished with tables, vases, and other articles of malachite. The specimens found in our own copper mines have only been employed to grace cabinets, in a mineralogical sense; but the time will yet arrive when it will be used in American ornamental art, rivalling the finest productions of the Russian Empire.