

A GREAT SILVER WARE MANUFACTORY.

The Way Silver Spoons are Made—One Thousand Dollars a Day Changed from Coin into Plate—The Most Complete Silver-Ware Manufactory in the World Two Tuns of Silver in process of Manufacture.

During a recent visit to Providence, R. I., we made a visit to Gorham & Co.'s manufactory of silver ware, and were politely shown over the establishment under the guidance of the designer, a remarkably intelligent Englishman. This man says that he is acquainted with the large silver-ware establishments in London, and that this of Gorham & Co., is the most complete of any in the world.

This firm make only solid silver, using the silver coin as they find it, neither refining nor adding alloys. It contains a very small proportion of copper.

The first step in the process is to melt the coin. This is done in plumbago crucibles set in furnaces of anthracite coal. No reverberatory arrangement is employed; the heat passing through the walls of the crucible. The metal is cast into an ingot—say an inch thick, 10 inches wide and 2 feet long.

The ingot is then passed between rollers and rolled down to a thin plate. The rolling is performed while the metal is cold; no annealing being required during the process as in rolling gold.

By means of massive machines, blanks are then punched from the plates of suitable size to make spoons, forks, teapots, &c.

Then comes the process of fashioning the articles into the proper forms for use and ornament. Several methods are employed for effecting this. A portion of the articles are placed upon an engraved steel die, and a mass of cast iron is allowed to drop upon it from a sufficient height to press the silver into the die and mold it in correspondence with the engraving. The bowls of the spoons are formed by laying the blank upon a lead matrix of the proper form, resting the end of a rounded steel punch upon it, and giving the punch a powerful blow with a sledge. Tea pots and similar articles of hollow ware are fashioned, by cutting a thin plate of metal into a suitable form, bringing the edges together and soldering them, and then beating the metal with hammers, drawing it into the proper shape by the same process as that employed by a blacksmith in making a ladle. Many hammers of a great variety of forms are used in this operation of raising, as it is called. Round articles, as the covers of tea pots, are spun upon a lathe in the usual way.

There are several processes of ornamenting. The most interesting of these is by means of lathes. The lathes are quite as perfect in workmanship and more complicated in construction than the lathes employed in bank-note engraving. Very complex contrivances are employed to give the tool the various motions required. In marking concave surfaces, for instance, the tool is always kept at right angles to the surface, and when occasion requires a vibrating motion is imparted to it, producing the beautiful waved lines so often seen on napkin rings. The chasing is done with a steel punch and hammer, and to prevent the ware from being forced out of shape in the operation, the vessel is filled with pitch. After the chasing is completed, the vessel is inverted in a warm oven, when the pitch is melted and flows back into the kettle, from which it may again be dipped. Some engraving is executed by hand, and cast ornaments are soldered to urns, pitchers, &c.

After the ornamenting is completed, the ware is cleaned and polished. The first operation in this part of the process is to scour it with sea-horse hide covered with sand. I saw a piece of natural hide 1½ inches in thickness. It is then scoured with rotten stone, and lastly with oxide of iron, called rouge. The rouge is applied first with a bob made of disks of woolen cloth fringed at the periphery, then with a similar bob of cotton, and lastly with that most perfect of all cushions, the human hand. The thumbs of the workmen engaged in this last labor become as thick and tough as leather.

One of the most interesting parts of the cleaning process is the pickling. The vase or bowl is placed upon a turntable so that it may be revolved, and is heated red hot by a flame; the rotation being for the purpose of heating the vessel on all sides equally and at the same time. The flame is formed by two currents,

one of illuminating gas and the other of atmospheric air, caused to mingle as they issue from the jet. The current of air is driven through its pipe by a fan and issues in a flaring flame a foot long, enveloping the ware and very quickly bringing it to a red heat. The heat oxidizes the alloy in the surface of the ware, and this oxide is then dissolved by placing the vessel in a bath of warm dilute sulphuric acid. This leaves the surface pure silver and of that soft lusterless white, which is sometimes left on the ware, and which is so beautiful. When a luster is desired this pure silver surface is rubbed down with a burnishing tool, or it is otherwise polished. Some of the burnishing tools are made of steel, and some of blood-stone.

The only remaining steps in the process are to pack the ware, send it to market, sell it and get the pay. Mr. Gorham told us that they received one remittance in gold from an old customer in New Orleans some time after the act of secession was passed in Louisiana.

Very few workmen are now employed in the establishment, but in ordinary times, 1,000 dollars in coin is melted every day, and more than two tuns of silver are constantly going through the process of manufacture. The designs are formed in clay and wax and are then produced in plaster or copper, and are preserved for publication in case that it is required. The designer's room is a large neat office, and contains a library of the most costly works on ornamental art.

RECENT AMERICAN INVENTIONS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list on another page:—

Tension Regulator for Sewing Machines.—The object of this invention is to increase the tension of the needle thread of a sewing machine in the same measure as the diameter of the bobbin in the shuttle decreases, and consequently the tension of the shuttle thread increases. The invention consists in the arrangement of a pulley with a long conical hub, said pulley being rotated by the action of the needle thread, in combination with a screw spindle and spring pad acting on the conical hub in such a manner that, during its operation of sewing and consequent decrease of the bobbin on the shuttle, by the action of the screw, the pulley assumes a gradual downward motion, thereby bringing thicker and thicker parts of the conical hub opposite the spring pad and causing a corresponding increase in the tension of the needle thread. The inventor is Paul Trybil, of New York city.

Explosive Projectile.—This invention consists, first, in a certain arrangement of obliquely expanding wings, for the purpose of obtaining a rotary motion of a projectile about its axis by the resistance of the atmosphere to its flight when fired from a smooth-bored gun. Second, in a certain mode of combining one or more expanding wings and nipples or their equivalents, for the reception of percussion caps or other percussion priming, in an explosive projectile, for the purpose of making such wings constitute hammers by which the said priming is exploded on the projectile striking. The inventor is William E. Browne, of Valley Falls, R. I.

Hotel Indicator.—The object of this invention is to obtain a device by which the number of drinks dealt out at a bar may be registered and counted by the proprietor, thereby serving as a check to the bar-keeper through whose hands the money passes into the till. It consists in the employment of a box provided with a ball receptacle and having a series of compartments in it which are numbered and provided with a tilting bottom placed over a drawer. This drawer receives the balls inserted in the compartments by the customers and which indicate the number of drinks that have been dealt out by the bar-keeper. The inventor is James McNamee, of Easton, Pa.

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