

surface by means of emery on a copper wheel as described, it requires a good polish, which may be increased by using "crocus powder" afterwards on a similar wheel. Iridium which has been melted by Mr. Holland's process is nearly as hard as the ruby, which is next in hardness to the diamond. It cuts glass readily; the best files are ruined by attempting to file it. It has about the color of steel. It is not attacked by acids and does not tarnish. The best steel tools fail to make any impression upon it. A metal with this wonderful combination of valuable properties, will undoubtedly find many uses to which it can be applied with great advantage.

It has already been successfully applied to electric lights; for contact points for telegraphic instruments; for bearings for balances; for fine scales; for jewels for watches and clocks; for bearings for mariners' compasses; for styluses; for drawing and ruling pens; for dental tools, etc. As iridium has a handsome, bright color, and is susceptible of a high polish, which does not tarnish or scratch, it promises to become an important factor in the manufacture of jewelry. Already it is being extensively used in combination with gold, silver and platinum, with which it alloys readily, in the production of sleeve buttons, pins, studs, etc. It is also used for jewelers' watches, and promises to be more valuable than the ruby for this purpose. Watch cases will also be soon introduced made of iridium.

This metal is now produced by the American Iridium Company, of Cincinnati, and letters patent have been taken out for the United States, Europe and Canada. It can be produced in masses of almost any shape desired, and the company is now making it in a variety of shapes to fill orders from some of the largest manufacturing jewelers in the country. Unquestionably iridium has a promising future before it, and its adoption in the arts will be watched with interest.—*Jewelers' Circular.*

#### ENAMEL PAINTING.

Enameling is only done on gold and copper, silver swells up and causes blisters and holes in the coat of enamel. All enamel paintings are, in fact, done on copper or gold. The goldsmith prepares the plate that is to be painted upon.

The gold should be twenty-two carats fine; if purer, it would not be sufficiently

stiff; if coarser, it would be subject to melt, and its alloy should be half white and half red—that is, half silver and half copper; whereby the enamel with which it is to be covered will be less disposed to turn green than if the alloy were entirely copper.

The workman must reserve for the edge of the plate a small fillet, which he calls the border. This ledge serves to retain the enamel, and hinders it from falling off when applied and pressed on with a spatula. When the plate is not to be counter enameled it should be charged with less enamel, as, when exposed to heat, the enamel draws up the gold to itself, and makes the piece convex. When the enamel is not to cover the whole plate, it becomes necessary to prepare a lodgment for it. With this view, all the outlines of the figure are traced on the plate with a black lead pencil, after which recourse is had to the graver. The whole space enclosed by the outlines must be hollowed out so as to be of a depth equal to the height of the fillet had the plate been entirely enameled. This sinking of the surface must be done with a flat graver, as equally as possible; for if there be an eminence, the enamel would be weaker at that point, and the ground would appear. Some artists hatch the bottom of the hollow with close lines which cross each other in all directions; others make lines or scratches with the end of a file broken off square. The hatchings or scratches lay hold of the enamel, which might otherwise separate from the plate. After this operation, the plate is cleansed by boiling it in an alkaline lye, and it is washed first with a little weak vinegar, and then with clear water.

The plate thus prepared is covered with a coat of white enamel, which is done by burnishing a piece of enamel in an agate or porcelain mortar to a coarse powder-like sand, washing it well with water, and applying it in the hollow part in its moist state. The plate may meanwhile be held in an ordinary forceps. The enamel powder is spread with a spatula for condensing the enamel powder the edges of the plate are struck upon with this spatula. Whenever the piece is dry, it is placed on a slip of sheet-iron perforated with several small holes, which is laid on hot cinders; and it is left there until it ceases to steam. It must be kept hot till it goes to the fire; for, were it allowed to cool, it would become necessary

to heat it again very gradually at the mouth of the furnace of fusion, to prevent the enamel from decrepitating and flying off.

The enamel plate, when cold, is to be washed in very dilute nitric acid, and afterwards in cold water, and a second coat of granular enamel paste is to be applied, with the requisite precautions. This, being passed through the fire, is to be treated in the same way a third time, when the process will be found complete. Should any chinks happen to the enamel coat, they must be widened with a graver, and the space being filled with ground enamel is to be repaired in the muffle. The plate, covered with a pure white enamel, requires always to be polished and smoothed with sandstone and water, particularly if the article has a plane surface; and it is then finally glazed at the fire. The painting operation now follows. The artist prepares his enamel colors by pounding them in an agate mortar, with a pestle of agate, and grinding them on an agate slab, with oil of lavender, rendered viscid by exposure to the sun in a shallow vessel, loosely covered with agate or glass. The grinding of two drachms of enamel pigment into an impalpable powder will occupy a laborer a whole day. The painter should have alongside of him a stove, in which a moderate fire is kept up, for drying his work whenever the figures are finished. It is then passed through the muffle.—*Watchmaker and Jeweler.*

#### FIRE GILDING.

We are pleased to give our readers the following reliable formula for fire gilding, for which we are indebted to *Ackerman's Illustrated Zeitung.*

The story is told, that the King of Bavaria, Louis I., wishing to ornament the large hall in his palace with twelve colossal statues of his ancestors, cast in brass and plated with gold by the application of heat, sent his privy-councilor to Milan to confer with Manfredini, the most celebrated metallurgist in Europe at that time, as to the feasibility of the undertaking. Manfredini's reply to the councilor was: "If any one succeeds in gilding one of those colossal figures in the way you describe, without at least two men having lost their lives during the operation, I will cut off my own head."

King Louis, however, refused to be discouraged, and soon had the satisfaction of seeing himself surrounded by the