

UNITED STATES PATENT OFFICE.

JACOB J. VOLLRATH, OF SHEBOYGAN, WISCONSIN.

ENAMELING IRON-WARE.

SPECIFICATION forming part of Letters Patent No. 250,465, dated December 6, 1881.

Application filed April 16, 1881. (Specimens.)

To all whom it may concern:

Be it known that I, JACOB J. VOLLRATH, a citizen of the United States, residing at Sheboygan, in the county of Sheboygan and State of Wisconsin, have invented certain new and useful Improvements in Enameling Iron-Ware; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The present invention relates to improvements in the art or process of enameling iron and iron and metal articles in general, whereby the enamel coating is made to adhere firmly to the iron and has a beautifully marbled or variegated surface of any desired color or design.

In carrying my process into practice I proceed as follows, viz: The iron or metal plates or articles to be enameled are subjected to the ordinary pickling, scouring, and washing operations, for the purpose of removing the scale or preparing the surface for the reception of the enameling compositions.

The art of enameling metals, as commonly conducted, contemplates the above steps, and also the employment of two or more coats of enamel—to wit, a body-coat prepared especially with the view to unite the iron with itself, and a second coat, usually colored with some metallic oxide, which imparts ornament and finish to the article—with often a third coat, especially designed to glaze or impart a polish.

It may be stated that the success and superiority of my process over other enameling processes heretofore known depends upon the nature of the compositions employed, and in the manner of applying the surface-coating which produces the marbled or variegated effects.

In all known processes the marbled, mottled, or spotted appearance of the enameled surface is caused by the oxidation of the metal surface during the operation of drying the enameling composition thereon.

It has been proposed to make the glaze or enamel ornamental by tinting or coloring the

same with any suitable coloring-matter, but no process heretofore known involves the production of a marbled surface in a systematic manner without depending on the oxidation of the metal for attaining the desired result.

The foundation or body coating used by me consists of the following ingredients, which are generally combined in the proportions specified, viz: sand, thirty-three parts; borax, twenty-two parts; mica, four parts; and lime, six parts. These materials are melted together in a suitable crucible, and the resultant composition is evenly spread or distributed on the surface of the article by dipping it into the composition, or by pouring it on the metal surface and spreading it thereon. The body or foundation coating is then permitted to dry, so that it will not crack or craze during the first burning process, which is effected in an ordinary muffle or other furnace at a temperature of about 1,600° Fahrenheit. The burning process ends when the body-coating is properly burned on or intimately combined with the metal.

A second coating or porcelain preparation, in a fused or melted state, is applied to the foundation-coating in the same manner as the first, and is affixed thereto or burned thereon at a temperature of about 1,000° Fahrenheit. This second coating is composed of the following ingredients, viz: feldspar, eight parts; borax, forty parts; soda, thirty parts; cryolite, twenty-five parts; and saltpeter, ten parts. A final coating or a composition for producing the marbled or variegated surface is then applied to the second coating, and is the same as the latter, with the addition of the desired coloring-matter. For producing a blue color potter's blue is added, and for a red color fifteen per cent. of oxide of iron and two per cent. of manganese are used in the marbleizing composition. The latter is spread on the surface to be ornamented, and is run over the same by properly manipulating the article, so as to cause the composition to form the desired veins, streaks, or other designs.

A suitable stencil or an impression block or form may be used for applying the marbled composition in a more systematic manner than when applied by hand-manipulation alone.

When white marble is to be imitated the ground is white, with gray spots, and for giv-

ing the appearance of red marble a copper-colored red coating, with white spots, is used, and for blue marble blue spots are added.

5 The marbleizing composition is applied to the vitrified or porcelain surface caused by burning on the second coating, and is firmly affixed thereon by subjecting it to the same temperature as said porcelain surface.

10 It will be obvious that the proportions of the materials used in the preparation of my compounds may be varied according to the strength or character of said materials, and that other vitrifiable or enamel compounds may be used in place of those above described for
15 attaining the desired result—viz., the production of metal ware or articles having marbled or variegated surfaces of a highly ornamental appearance.

20 I am aware that it has been proposed to form an enamel of cryolite or its chemical equiva-

lent and silica fused together and used either with or without metallic oxides.

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

25 The process of enameling and marbleizing metal surfaces consisting of the following steps, viz: applying a vitreous coating to the metal and burning it thereon, then applying a porcelain or enamel composition to the first
30 coating and fixing it by burning, and then applying a tinted enamel composition in a systematic manner, and fixing it by a final burning operation, as and for the purpose set forth.

35 In testimony whereof I affix my signature in presence of two witnesses.

JACOB J. VOLLRATH.

Witnesses:

WM. H. SEAMAN,

FRANCIS WILLIAMS.