

[Continued from first page.]

Feldspar ware, according to St. Amand, consists of: Clay, 62 parts; kaolin, 15; silix, 19; feldspar (decayed), 4; and covered with the following glazing: Oxide of lead, 52 parts; kaolin, 25; silix, 13; crystal glass, 10; total, 100.

The machines used for shaping fine faience are identical with those used for ordinary faience. For some articles which are manufactured in very large quantities, as plates, special machines have been devised.

Fig. 3 represents a plate machine. The shaft of the wheel carries at the top a circular block of wood, forming the counterpart of the inside of a plate. A sufficient quantity of clay, rolled so as to form a sheet of the required thickness, is placed upon this block and pressed down closely. To a standard is attached the shaping tool or "caliber," movable in vertical direction. Its profile at the lower edge corresponds exactly to the external form of the plate. By causing the wheel to revolve slowly, the plate is brought into the desired shape.

For forming articles not of circular shape or otherwise difficult to form, moulds of plaster of Paris are used. These, when dry, rapidly absorb the water from the clay and cause it to harden rapidly.

To bake the biscuit, the temperature must be brought up to about 100° Wedgwood's pyrometer; for enameling, 10° to 30° are sufficient.

Although not strictly belonging to the faiences, we may nevertheless mention in connection with it the so-called "gray pottery" (grès-cérames). It consists of dense, heavy material, which rings with a metallic sound. It is opaque, of a finely grained texture, and sometimes nude, sometimes glazed with a mixture of salt, oxide of lead, and silica.

Ordinarily it receives a sort of vitreous covering all over the surface, consisting of silicate of sodium and alumina, during the first baking, and a repetition of this latter operation is thus rendered unnecessary. The purpose is accomplished by simply mixing sea salt with the fuel used for baking. The salt evaporates, and the vapor, coming in contact with the heated articles, decomposes; the sodium oxide and the various other oxides generally contained in sea salt unite with the

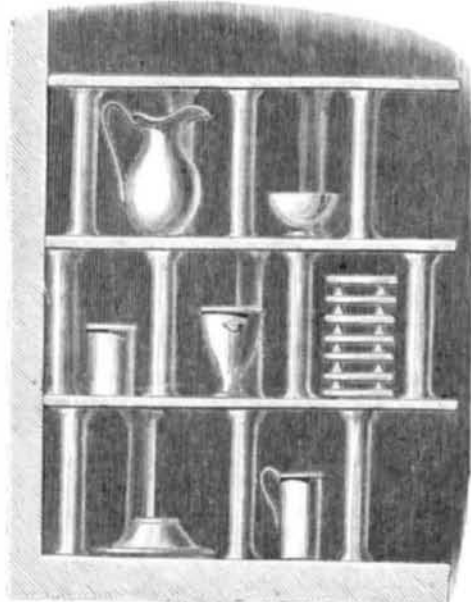


Fig. 4.—POSITION OF ARTICLES IN OVEN.

silica of the vessels and form a glass, which penetrates into the pores of the clay and renders it impermeable and glossy. This simple process is the invention of Wedgwood. 100° to 120° of heat (Wedgwood) are required to finish it. Fig. 7 represents an oven used for baking gray pottery. The articles to be baked are placed on Wedgwood shelves.

Gray pottery is very hard and brittle. It cracks frequently on sudden changes of temperature and when directly exposed to the fire. This quality of ware may be white or colored. The following is the composition of the material used in its manufacture:

White.—Kaolin, 25 parts; clay, containing a little kaolin, 25; feldspar, 50; total, 100.

Colored.—Kaolin, 14 parts; clay, 14; silix, 15; pegmatite (decayed), 27; sulphate lime, 21; sulphate of baryta, 9; total, 100.

Black.—Kaolin, 2 parts; clay, 49; calcined ocher, 43; manganese (black), 7; total, 100.

Gray pottery was manufactured extensively thousands of years ago by the Chinese and Japanese. A Japanese vase is exhibited at the Louvre, 2½ feet high and 2 feet wide, which was manufactured at Meissen by Boettcher, previous to the invention of porcelain.

BLASTING BY COMPRESSED AIR.

The risk attending the use of gunpowder or other explosives in coal mines has led to the trial of compressed air for breaking down coal, experimentally that is, and the experi-

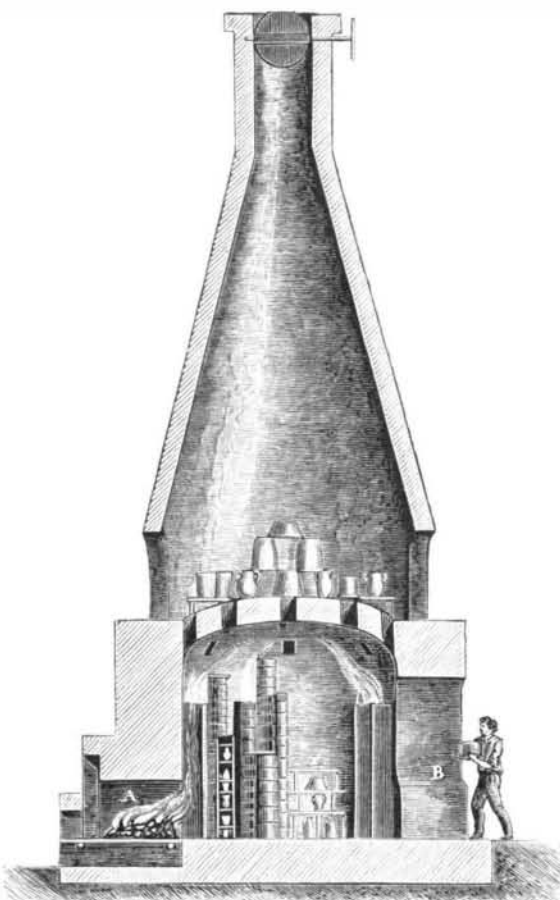


Fig. 5.—OVEN FOR BAKING AND ENAMELING.

ment seems decidedly promising. A small portable machine was used, by which two men were able to compress air so as to give a pressure of 14,200 lb. to the square inch. The compressed air was conveyed through wrought iron pipes to a cast iron cartridge, 12 inches long, placed in a hole drilled in the coal; into this cartridge the air was forced until it burst, breaking down the coal. A pressure of 9,550 lb. to the square inch was found sufficient to break down hard coal.

In a paper lately read before a meeting of coal miners, at Manchester, England, one of the inventors of this system, Mr. W. E. Garforth, of Dukinfield, expressed the conviction that before long a pressure of ten, fifteen, or twenty thousand pounds per square inch would be so utilized that they would be able to put into the miner's hands a power that would enable him to get out coal, without risk, either from blown out shots, explosions, or the production of deleterious gases.

Comparing the two systems of breaking down coal—by gunpowder and by compressed air at 8,000 lb. pressure per square inch and upward—Mr. Garforth thought that the latter would be nearly, if not quite, as expeditious as the former, while it possessed many signal advantages, especially in the matter of safety.

Remedies for Biliousness.

Dr. Rutherford says: "As yet we have found 4 grains of iridin a certain remedy for biliousness. It may be made into

a pill with confection of roses, and taken at bedtime. It produces no disagreeable sensations, and on awaking in the morning the yellow tongue is clean, and the headache and malaise are gone. As iridin, though a powerful hepatic, is not a powerful intestinal stimulant, it is well to give in the morning an ordinary mild saline aperient, such as Püllna water. Iridin, though an agreeable remedy at the time, has a somewhat depressing effect, and it probably should not be taken much oftener than once a week."

Dr. Rutherford also states that "euonymin is a hepatic stimulant in man as it is in the dog. Two grains of it made into a pill with confection of roses, and taken at night, seem to be as efficient a remedy for biliousness as iridin. If the dose be not too great it leaves no depression. A dose of a saline aperient should be taken in the morning. I have been much struck with the success of euonymin in functional derangement in several persons who had tried nearly all the commonly used cholagogues with varying and often limited success. I have no doubt that in consequence of our experiments euonymin will come to be a universally employed hepatic stimulant."

The Spectrum of Brorsen's Comet.

Professor C. A. Young, of Princeton, writes to the *New York Times* saying that Brorsen's comet has not an exceptional spectrum, as indicated by Huggins' observations of 1868, but falls into line with all the other comets. Professor Young's observations were made upon the evenings of April 1 and 2, and a comparison between the spectrum of the comet and that of the flame of a Bunsen burner showed a coincidence exact within the limits of observation.

RECENT AMERICAN PATENTS.

An improvement in oil stills has been patented by Mr. Clark Alvord, of Kendall Creek, Pa. It consists in a series of metal rods arranged permanently in the bottom of a still, and projecting downward toward the fire and upward into the oil. The object is to thoroughly distribute the heat through the oil.

An improved soldering machine, patented by Messrs. Joseph W. Miller and Bernard Coll, of Baltimore, Md., is designed for rapidly soldering the tops and bottoms of cans, pails, etc. It has novel features, which cannot well be described without an engraving.

An improved water elevator, patented by Mr. A. W. Coates, of Alliance, Ohio, is provided with a weighted

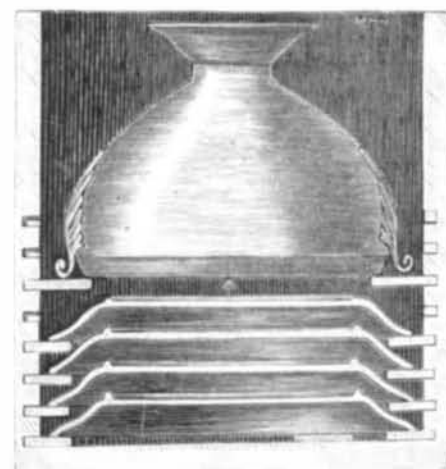


Fig. 6 INTERIOR MUFFLE.

plunger, which, by its descent, forces water up through a stand pipe.

Mr. W. E. Washburn, of Sackets Harbor, N. Y., has patented an improved hampering pad for horses, which consists of two plates, one carrying points, which stand opposite perforations in the other, when they are in their normal condition pressed apart by a spring. When the horse presses against a fence or other object with his breast he is pricked by the points.

Mr. C. S. Piersons, of Sandy Hill, N. Y., has patented an improvement in harness, which renders it stronger, lighter, and more durable, and less expensive than ordinary harness. Its construction cannot be described without an engraving.

A compact and convenient receptacle for holding flour for household use, has been patented by Mr. Joseph Johnson, of Marshalltown, Iowa. The invention consists in a cylindrical receptacle having a grid for supporting the body of the flour, and a rotary sieve for sifting it and delivering it to a chest, upon which the receptacle rests.

Mr. G. D. Eighmie, of Poughkeepsie, N. Y., has patented an improvement in men's drawers, which consists in cutting the

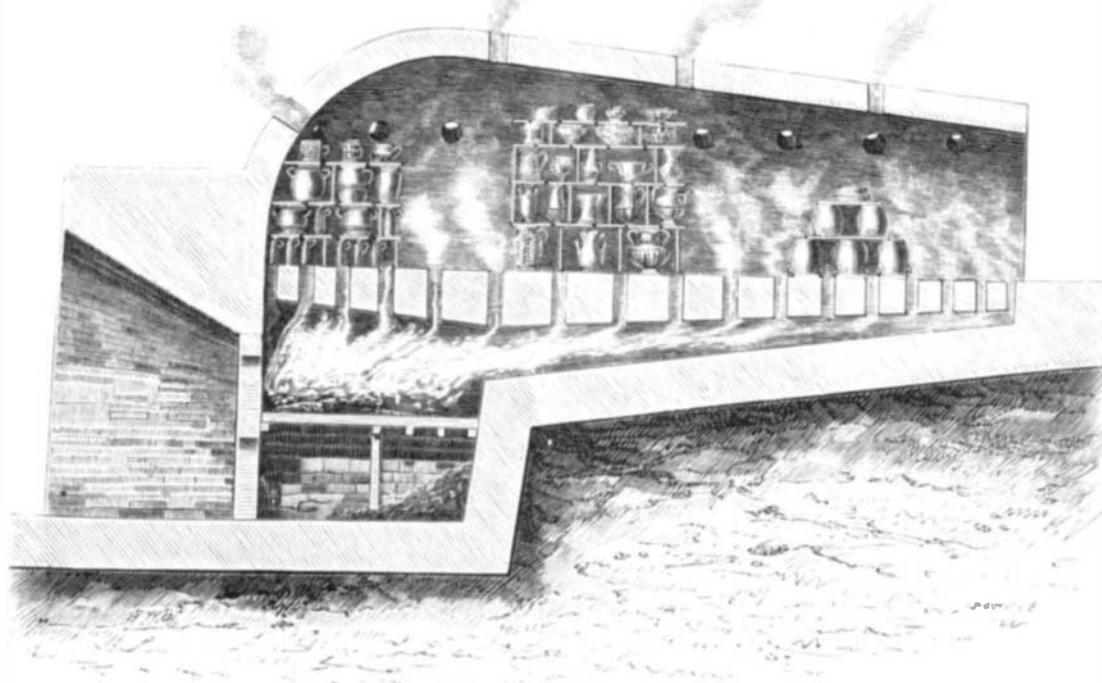


Fig. 7.—OVEN FOR GRAY WARE.