Correspondence

Porcelain and Opalescent Glass.

MESSRS. EDITORS:—The following communication serves as an answer to your wish expressed, page 233, that some of your readers would send you for publication the formula for the manufacture of porcelain glass. In the glass houses this is usually called "bone glass," the chief ingredient being burnt bones. As the cheapest and best for its production, jawbones are preferred, probably on account of the enamel of the teeth they contain. After burning, they are ground and mixed carefully with the powdered mass of which the common glass is usually made, namely, old broken glass, white sand, oxide of lead, lime, and potash.

There is no decided formula for the proportion, but the quantity of bone ash is varied in accordance with the degree of opaqueness it is intended to give. Two per cent is the least, 30 the maximum; this makes the glass perfectly opaque. As bone ash consists of phosphate of lime, it is clear that the phosphoric acid causes the opaqueness, as the lime by itself makes with silica a transparent glass; remelting makes it more opaque, probably by causing a more perfect combination of the phosphoric acid with the other ingredients.

Quite recently, burned guano has been introduced in Germany for the manufacture of porcelain glass; as guano consists chiefly of very finely divided phosphate of lime, it is very successful and even cheaper than bone glass. The prescription for a superior quality of guano glass is: pure sand, 120 parts; potash, 70; calcined soda, 10; common salt, 3; saltpeter, 6; red lead, 20; guano ashes, 60; manganese, ½, and borax, 3.

Oxide, too, may also be used; but as it requires more to produce the same effect, and, besides, is much dearer, its use has been almost abandoned. Arsenic, however, is, in many glass works, used in small quantities as an addition to the bone ash.

This kind of glass shows always more or less opalescence, that is, a play of colors when looked through in different directions, and inclinations of light. In the above-described glass it is often somewhat reddish, but this may be modified, increased, or changed by the addition of different metallic oxides, as yellow by oxide of uranium, and a most brilliant green by adding to this forge scales or oxide of nickel.

A new field of industry may be opened by combining the substances used for coloring glass with this porcelain glass, and the application of this beautiful compound for the manufacture of objects of taste and usefulness, namely, brownish yellow, by charcoal or soot; green, by protoxide of iron; bright yellow, by antimoniate of potash; red, with sesqui-oxide of iron. The Bohemian orange glass is produced by the mixture of the two last. Emerald green, by oxide of copper; bright red, by very small quantities of suboxide of copper; ruby, scarlet, carmine, and rose, by gold, used in the form of purple of cassius; amethyst color, by oxide of manganese; grass green, by sesqui-oxide of chromium; blue, by cobalt, etc., etc.

In closing, I will remark that the above is of special importance to the analytical chemist, as the art of testing mineral substances by the blow-pipe is, to a considerable extent, founded on this peculiarity of many metals of giving to glass different particular colors; this being applied on a very minute scale, namely, a glass bead not much larger than a pin head suspended at the end of platinum wire, and exposed to the inner or outer flame before the blowpipe.

P. H. VANDER WEYDE, M. D.

Philadelphia, Oct. 23, 1866.

A Singular Quality in Steel.

MESSRS. EDITORS.—In Vol. XV., No. 19, of the SCIENTIFIC AMERICAN, I notice an article by your correspondent, "E. P. W," in which he speaks of a singular quality of steel. During the war I was engaged in the manufacture of cavalry sabres for Government. In the severe tests to which every blade was subjected, some of them would be found too soft; these I would heat to a blue, and let them cool off, and they would nearly all regain their elasticity, the same as they were before they were polished, but in polishing about one-fourth of them would again lose their elasticity. By experimenting I found that when they first came from the fire after being blued, or "stiffened" as we called it, to dip them into a solution of sulphuric acid and water, about six parts of water and one of acid, would remove the blueing; and then as soon as they came out of the acid dip them into strong lime water, which would destroy the acid, and prevent the blades from rusting, when, if wiped off, they would retain their elasticity. This seems to show that it was not removing the blueing that caused them to lose their elasticity, but what was polished off of the outer surface of the steel. Circular saws or any other tools that are too soft may be stiffened in the same manner. I tried to stiffen blades in this way before they had been hardened and tempered, but the process had no effect whatever. Having never tested the blueing process on the cutting quality of steel, I am unable to state the facts, but presume it will improve a tool that is too soft in the same proportion that it will improve its elasticity.

J. E. E.

Trenton, N. J., November, 1866.

PATENT OFFICE DECISION----CARTRIDGES.

BEFORE THE EXAMINERS-IN-CHIEF ON APPEAL.

Hon. Elisha Foote for the Board.

Alleged Improvement in Cartridges.

The applicant provides a metallic stem or needle, that, passing through the charge, fires, when struck by the hammer, a percussion cap at the base of the ball. The cartridge is filled, around the stem, with two grades of powder—coarse next to the ball, and fine in the rear.

In the use of the stem to fire the charge in front, the applicant has been anticipated. It was patented to C. E. Snyder, in Oct., 1864, and in consequence, he has limited his claim to its combination with the use of powder of different degrees of fineness; or, as he terms it, his accelerating charge.

The applicant's theory is, that the coarse powder around the fulminate will be first ignited, and burn slowly, while the ball is being started and put in motion; then the fine powder will be reached, and a more rapid combustion and powerful impulse ensue.

The applicant has also two other arrangements and claims for them. In these, the grains of powder are uniform. In one, the cartridge is fired at both ends simultaneously, and it is supposed that by this double combustion, a great amount of powder will be burned and powerful impulse given. In the other, the firing is at the center, and it is imagined that the combustion proceeding thence outward, and constantly enlarging the sphere of its action, will keep up and increase the pressure of gas until the ball leaves the gun.

We apprehend that the applicant is entirely mistaken in his theory of the combustion of powder. The heated gases of the fulminate, almost instantly, permeate the whole mass, entering the interstices between the grains and firing, practically, every grain at the same moment. These, then, burn from the surface only, and the times of their combustion depend upon their sizes.

The idea of placing coarse powder next to the ball, and fine behind it, and firing in front, is not a new one, but has often been tried. Charges have also been fired at different places at the same time, and vent holes have been placed in front, at the rear, and at different places along the sides; but all these variations have failed to produce any practical effect.

The applicant's devices lack, therefore, one of the essential elements of a patentable invention, to wit: that of producing a new and useful result. It is not every new combination, nor every new device that is patentable. Both must be the result of invention rather than of mere mechanical skill, and both must produce new results.

We do not propose to set up our views in opposition to any practical effect that any one may obtain. But when a patent is desired, for what appears to be opposed to mechanical principles, or for results or processes that are opposed to former experience, some evidence should be furnished that the world has been mistaken before a patent is issued.

The Statute under which we act authorizes patents for inventions only when "deemed to be sufficiently useful and important." It cannot be expected that, under this authority, the office should give its sanction to anything that is absurd, or to fancied results that are opposed to general experience.

The decision of the Examiner must be affirmed.

NOTE.—A Patent was subsequently issued for this cartridge by the Commissioner. We are not informed upon what grounds.

Inventions Patented in England by Americans.

Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

2,299.—HAT OR COVERING FOR THE HEAD, PARTS OF WHICH IMPROVEMENTS ARE APPLICABLE TO PARASOL OR FAN.—William H. White, Kent Island, Md. Sept. 7, 1866.

2,421.—METHOD OF LUBRICATING VERTICAL SPINDLE OR SHAFT, AND APPARATUS FOR EFFECTING THE SAME.—Thomas Marsh, Central Falls, R. I. Sept. 21, 1866.

2,425.—NEW MACHINE FOR SETTING AND DISTRIBUTING TYPE.—John A. Gray and Samuel W. Green, New York City. Sept. 21, 1866.

2,427.—PICKER MOTION FOR LOOM.—Hosea Elliott, Globe Village, Mass. Sept. 21, 1866.

2,451.—MACHINERY OR APPARATUS FOR FILTERING LIQUIDS.—Robert Stewart, Brooklyn, N. Y. Sept. 24, 1866.

2,471.—LAMP FOR BURNING VOLATILE OILS, SPIRITS, AND OTHER FLUIDS.—Henry A. Gadsden, New York City, temporarily residing at Havre, France. Sept. 25, 1866.

2,491.—COLLECTING AND DELIVERING LETTERS AND PARCELS, AND APPARATUS FOR THE SAME.—Alfred E. Beach, Stratford, Conn. Sept. 26, 1866.

2,548.—MACHINERY FOR CUTTING FILES AND RASPS.—Alfred Weed, Boston, Mass. Oct. 3, 1866.

2,549.—FILE-CUTTING MACHINERY.—Alfred Weed, Boston, Mass. Oct. 3, 1866.

2,585.—MANUFACTURE OF LEATHER BINDING.—Matthew H. Merriam and Eugene L. Norton, Charlestown, Mass. Oct. 8, 1866.

EXTENSION NOTICES.

William Stratton and Matthias Stratton, of Philadelphia, Pa. having petitioned for the extension of a patent granted to them the 1st day of February, 1853, for an improvement in portable gas apparatus, it is ordered that the said petition be heard on Monday the 14th day of January next.

Notes and Queries

F. M. E., of Mo.—In our issue of the 3d inst., our reply to your queries was somewhat incorrect, as we have since ascertained from the manufacturers of rubber belts These belts can be kept from slipping by lightly moistening the side next the pulley with boiled linseed oil. Animal oil will not do. Belts of good vulcanized rubber will stand a high degree of heat without injury.

A. S., of Del.—Phosphorus alone cannot be reduced to the form of a paste, but it may be mixed, by melting and stirring, with many substances of a pasty consistence. It is melted with grease for a rat poison, and mixed with gum water for friction matches.

C. P. L., of Mo., has a cellar 300 feet from a river. During high water in the river, the water percolates through the soil and floods the cellar. He desires to know how to make a good bottom to keep out the water. If bricks are cheap enough in his neighborhood, we advise him to lay down, in cement, a brick flooring. The pressure of water on the bottom might be as great as in a cellar on the same level at the bank of the river.

P. L., of Iowa.—The centrifugal force due to the revolution of the earth to some extent counteracts gravity, and consequently at a given distance from the center of the earth, any body will weigh less at the equator than any where else on the globe; the pressure of the air is less at the equator than at your place.

C. E. B., of Mass.—We know of no work which treats especially of electro-magnetic engines. The details of most of the engines already built are to be found in former volumes of the SCIENTIFIC AMERICAN. The scientific theory of the subject can be found in many of the text books on chemistry and natural philosophy. The most extensive treatise on electricity is by De la Rive. . . . Shellac dissolved in alcohol is the best insulating varnish. . . The U magnet which gives the greatest power for a given weight is thicker at the poles than at the neutral part. . . The wire of the electro-magnet may be effectually insulated by winding so that the spires do not touch each other and separating the courses by paper.

J. G. B., of N. J.—For grinding and polishing articles of hardened steel, wheels of corundum are used. They can be purchased at any first class machinists' findings establishment. A cylindrical plug for a templet is more readily reduced to size, however hard, by this means than any other we know. It leaves a very good surface, needing only polishing with bluestone, rottenstone, crocus, and rouge.

E. F. C. D., of Md.—A composition of 4 parts copper, 1 of tin and ¼ part zinc will make a metal suitable for small working models, having a good color and being easily wrought. Doubling the proportion of zinc will increase its hardness. The best material for a mold is fine molding sand that has been used. It should be free from clay, should take a fine impression of the skin when squeezed in the hand, and be capable of being cut into slices by a sharp knife without crumbling.

W. S. P., of N. Y.—Plaster of Paris is usually cast in molds of the same substance. The inside of the mold should be varnished with shellac.

G. F., of Pa.—Cast steel is steel that has been melted and run into molds. Other kinds of steel can be produced by cementation, puddling, hammering, and rolling. Cast steel is just what its name implies.

H. D., of Mass.—Manuscript for the printer should be written on one side of a sheet only. It is more convenient for "setting up" if not written across both pages of a sheet of note or letter paper. Use 1st and 3d pages for your writing.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

SCREW FOR CHAIRS, ETC.—LOUIS POSTAWKA, Boston, Mass.—This invention relates to an improvement in the construction of a screw for elevating and depressing a piano chair without turning the seat or stand around, which may be applied also to writing desks and similar articles.

WATER-PROOF MAIL BAG.—JAMES M. JARRETT, Brooklyn, N. Y.—This invention has for its object to furnish an improved mail and express bag so constructed and arranged that it will be water-proof, and be sufficiently buoyant to float in water even when filled with mail or express matter.

BARN-DOOR FASTENING.—DAVID N. MINOR, Bridgewater, Mich.—This invention has for its object to furnish a convenient, durable, and secure fastening for barn and other similar doors.

DOUBLE-HEADED WRENCH.—JOHN J. LOVE, New York City.—This invention has for its object to furnish an improved wrench, simple in construction, easy of adjustment, and strong.

GATE HINGE.—BURTON GREENSIDE, Fort Dodge, Iowa.—This invention has for its object to furnish an improved hinge for hanging gates and doors.

HORSE CULTIVATOR AND HOE.—AMOS W. ROSS, Northfield Mass.—This invention consists in placing the cultivator upon wheels which may be adjusted, so that the cultivator may be carried with its teeth and hoes raised from the ground, or so lowered that they may enter it to any desired depth.

SAWING MACHINE.—CHARLES W. SAPPENFIELD, Crawfordsville, Ind.—This invention has for its object to furnish an improved sawing machine by means of which cord wood or other wood or timber may be sawed rapidly.