

potash solution use a half pound to a gallon; for acid solution use sulphuric acid 4 pounds, nitric acid 2 pounds, water 4 pints; for cyanide of potash solution use 1/4 pound cyanide of potassium to 1 gallon of water. You should not attempt to work at it without having a good manual on the subject, such as Watt's "Electro-Deposition of Metals," which we can send you by mail for \$3.50.

(3) G. J. P. asks: 1. What acids and in what proportion will etch type metal? A. Take nitric acid 1 part, water 5 parts. Mix. 2. How is the colored lacquering done, such as used on the inside of small glass balls and toys, for Christmas tree decoration, etc.? It is of all colors and remarkably brilliant. A. The cheaper colored balls contain a quickly drying colored varnish or paint put into the ball and distributed by turning the globe about. 3. Where to get fatty ink spoken of in your paper, and used for drawings in etching zinc plates? A. The manufacturers of fine printing inks will furnish such an ink.

(4) A. P. S. writes: I read that if steel is immersed in carbonate of potash for a few minutes it will not rust for years, even if exposed to a damp atmosphere. Could it be applied to gun barrels or locks, without in jury to the same, and would subsequent oiling affect the result? A. The carbonate of potash only neutralizes any acid that may be upon the surface of steel or iron, and while it remains as a film, neutralizes the oxidizing properties of moist air in contact. Oiling with neutral oil (free from acid, preferably linseed) will further protect the surface. Any wiping of the articles or handling the surfaces covered by the carbonate destroys its protecting properties. It will serve but little good on a gun barrel that is handled. Frequent oiling and wiping is recommended.

(5) A. C. R. writes: I have some rattan baby carriages that have become soiled. I wish to stain them cherry color. How can I do it? A. For cherry stain, take of rain water 3 quarts, annatto 4 ounces; boil in a copper kettle until the annatto is dissolved, then put in a piece of potash the size of a walnut, keep it on the fire about half an hour longer, and it is ready to bottle for use. 2. I have a lot of kerosene lamp burners that have become black and soiled. What is the cheapest way to make them look bright? A. Use oxalic acid and whiting mixed and applied wet, with brush, and brushed again when dry with soft plate brush to polish.

(6) H. & W. ask: We have connected with our planing mills a dry kiln for lumber, which we dry with hot air. After this hot air has passed through the lumber, we convey it into the shop for heating purposes. Do you consider this manner of heating shops healthy, especially after the hot air has passed through a kind of green pine? A. We should think it was healthy.

(7) R. W. asks: Granted a vessel weighs 10 tons, i.e., displaces 10 tons of water, is it not possible to float that vessel in much less than 10 tons of water in a lock or shell? Will her water line not remain the same? Is it not theoretically correct that the Great Eastern may be floated in a pail of water? A. Yes, to all the queries.

(8) G. J. H. asks: A good receipt for blacking the inside of a photograph camera and bellows. A. The proper black for inside optical work is made with shellac varnish. Mix lamp black with pure alcohol to the required thinness, and add a few drops only of shellac varnish, just enough to make the lamp-black stick without being shiny. Make a little trial on paper, as you are adding the shellac, to get the exact proportion. 2. My camera is made of Spanish cedar. Please give me a receipt for polishing same. A. Oil the box with boiled linseed oil and dry, and finish with French polish. We can send for 25 cents French Polisher's Manual on staining and polishing of wood.

(9) R. writes: A bets B that four 1 inch pipes will radiate more heat than one 4 inch pipe. Who wins? A. A wins, according to arrangement of pipes.

(10) T. H. asks: How is emery made to adhere to leather? Is common glue used, or is there a waterproof cement used? A. Use the strongest glue, rather thick; brush on the leather even, and sprinkle the emery over; press it down with a block or mallet. When finished and dry, the surplus will fall off.

(11) J. F. N. asks how to coat small iron articles with black enamel or varnish such as is used on small buckles, etc. A. String the articles on fine wire, and dip in thin japan varnish. Bake in an oven or box heated to 260°, steam heat is safest. Care should be had that the vapor from the varnish does not come in contact with fire.

(12) A. B. asks: Is there any way of treating soft rubber so that grease will not affect it? A. There is not.

(13) E. H. desires the process of preserving natural flowers by the wax solution process. A. Dip the flowers in melted paraffine, withdrawing them quickly. The liquid should only be just hot enough to maintain fluidity, and the flowers should be dipped one at a time, held by the stalks, and moved about for an instant to get rid of air bubbles. Fresh cut flowers, free from moisture, make excellent specimens in this way.

(14) S. R. B. asks how to tan a swan's skin without injuring the down. A. Thoroughly impregnate the fibrous part with a mixture composed of 4 parts alum and 1 part pepper and saltpeter. See "The Taxidermist's Manual," which we can send you, post paid, for \$1.25.

(15) E. H. asks a good receipt for making ink for use on stamp pads. A. Use an ink consisting of aniline violet 1/4 ounce dissolved in 15 ounces alcohol and 15 ounces glycerine added. If you prefer other aniline colors, they can be used instead.

(16) J. J. C. asks how to silver-plate a door plate and bell, by using a powder or liquid. A. Mix 1 part chloride of silver with 3 parts pearl ash, 1 1/2 parts common salt, and 1 part whiting, and rub the

mixture on the surface of brass or copper, previously well cleaned, by means of soft leather or a cork moistened with water and dipped into the powder. When properly silvered, the metal should be well washed in hot water, slightly alkalinized, and then wiped dry.

(17) J. E. P. asks: How are lead bullets polished? A. By being revolved in a cask containing black lead or plumbago.

(18) C. M. R. asks: What will restore the appearance of red brick walls, and make them look fresh and new? A. Use a red wash made by melting 1 ounce glue in a gallon of water; while hot, put in a piece of alum the size of an egg, 1/2 pound Venetian red, and 1 pound Spanish brown. Try a little on the bricks, let it dry, and if too dark, put in more water; if too light, add more red and brown. 2. Can diamond dyes be dissolved in anything so as to be used to paint lantern slides? A. Dissolve in alcohol. Lantern slides are painted with very thin colors, and generally not with aniline paints.

(19) J. A. V. desires (1) a good receipt to prevent water from having a disagreeable taste. A. Mix it with charcoal and filter; this will render it both colorless and odorless. 2. How to make collars stiff and glossy. A. Pour a pint of boiling water upon two ounces of gum arabic, cover it, and let it stand all night. Use a tablespoonful of this to a pint of starch.

(20) D. R. writes: We have plenty of theories as regards the sources of heat, but no one tells us satisfactorily whence the cold comes from, or accounts for the intensity of cold. A. Cold is the absence of heat, or the elimination of the vibrations that cause heat. Heat vibrations are supposed to have their limit at 459° below zero.

(21) H. H. S. asks: How can I give a high glaze to an oil painting? A. Use the following varnish: Take of mastic 6 ounces, pure turpentine 1/2 ounce, camphor 2 drachms, spirits of turpentine 1 1/2 ounces. Add first the camphor to the turpentine; the mixture is made in a water bath. When the solution is effected, add the mastic and the spirits of turpentine near the end of the operation; filter through a cotton cloth.

(22) A. K. asks what washing compounds (powders), such as "pearline," "soapine," etc., are composed of, and how compounded. A. The exact composition can only be ascertained by analysis, but their detergent qualities are due to pearl ash, soda ash, and similar alkaline compounds.

(23) C. asks (1) the best and quickest way of making vinegar in quantity. A. See process described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 313. 2. The best way to make acetic acid without distillation. A. The simple oxidation of alcohol produces acetic acid. Treat alcohol in the same way as you would cider, to produce vinegar. In fact, vinegar is only an impure acetic acid.

(24) F. J. S. asks: What will keep tents from mildewing in warm weather? A. Use a mixture of solutions of alum and sugar of lead.

(25) J. N. G. desires a cure for bunions. A. An inflamed bunion should be poulticed, and larger shoes worn. Iodine 12 grains, lard or spermaceti ointment 1/2 ounce, make a capital ointment for bunions. It should be rubbed on gently two or three times a day.

(26) F. T. asks: What will take oil stains and rust stains out of marble? A. Apply common clay saturated with benzine. If the grease has remained long enough, it will have become acidulated, and may injure the polish, but the stain will be removed.

TO INVENTORS.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

February 7, 1888,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with names and page numbers, including Advertising cabinet, Air compressor regulator, Alarm, Amalgamator, Anchor, Animal trap, Animals, Anti-rattler, Atomizer, Axle box, Ball bat, Bar, Bathing purposes, Battery, Bed bottom, Bed spring, Bell, Belting, Blowpipe, Bobbin winder, Boiler, Boilers, Boot or shoe, Box, Box for furs, Branding implements, Brick kiln, Brush, Buckle, Buggy top, Buildings, Burner, Burnishing machine, Bustle, Button, Car coupling, Car door, Car dumping, Car electric motor, Car passenger, Carriage wheel, Carriages, Cart, Cash register, Caster, Chain, Chain drive, Chain links, Chair, Chair, Chimney top, Chopper, Chuck, Churn cover, Chute, Cigar tip cutter, Cigarette machines, Clamp, Clasp, Clasp, machine for making metallic, Clock striking mechanism, Clothes wringer, Coal hods, Coffee pot, Cofferoaster, Coffin fastener, Coin holder, Compensator, Condensing and cooling purposes, Cooler, Cooking utensil, Coop, Copper, Copying, letters and documents, Cornet tremolo, Cotton chopper, Cotton chopper, Counterstiffener machine, Coupling, Cranberry cleaning and separating machine, Crusher, Cup, Cutter, Damper regulator, Derrick, Derrick, portable, Die, Drills, Dust collector, Dyeing or scouring machine, Eaves trough hanger, Eaves trough hanger, Egg preserver, Elevator, Elevator alarm, Elevator safety appliance, Electric circuit closer, Electric machines, Electrical distribution system, Embroidering machine, Embroidering machines, End gate, Engine, Extractor, Fan, rotary, Farm gate, Feed water purifier, Fence, Fence, wire, Filter and purifier, Fire alarm, Fire alarm, Firearm lock, Firearm magazine, Fire work, Floor, Flouring mill, Fluid motor, Frame, Frogless switch, Furnace, Gas apparatus, Stillman, Gas burner, Gas burner, incandescent, Gas burner, regenerative, Gas engine, Gas lighter, Gas lighting burner, Gas lighting burner, electric, Gas manufacturing water, Gasoline can, Gate, Glass shingle, Grain binder, Hame fastener, Hammers, Handle, Hanger, Harness, Harvester, Harvester and husker, Harvester reel, Hay or grain elevator, Hay press, Heel nailing and trimming machine, Hoisting apparatus, Holder, Hook, Horse cover, Hot air furnace, Hydraulic motor, Ice creeper, Incandescent devices, Indicator, Inhaler, Iron, Jar fastener, Jar fastening, preserve, Journal box, Ladder, Lamp, electric arc, Lamps, apparatus for extinguishing the lights of, Last block fastener, Latch, gate, Lathe head stock lock, Lathe, wood turning, Leaf turner, Leather dressing machine, Level, plumb, Level, plumb, C. Marshall, Level, plumb, Wentworth & Traver, Line holder, Liquids, indicator for non-transparent receptacles containing, Lock, Locomotive ash pan, Log rolling device, Loom, Loom, let-off mechanism, Loom, reedle, Lubricator, Magnetic separator, Mashing machine, Mast, hollow, Mat, Measuring vessel, Meat preserving, Mechanical movement, Mechanical movement, electro, Mechanical movements, electrical apparatus for effecting, Medicine cup and stopper, Metal bar mat, Metallic mat or floor covering, Metallic wheel, Meter, Milk cooler, Mill, Mining cages, Molasses gate, Motor, Mower, lawn, Mowers and reapers, Morton & Brown, Music stand, Nail, Nail extractor, Nails, die for cutting and pointing wire, Nut lock, Nut lock, W. H. Haws, Oil can, Oil cup, Oils, refining vegetable, Ore crusher, Package comprising fragile articles, Packet folding machine, Packing case fastening, Packing, piston, Pan, Pans, body wire and handle for dish, Paper box, Paper tubes, machine for making, Paper weight and pen, pencil, or cigar holder, Photographie accessory, Photographie cameras, shutter mechanism for, Photographie printing in fatty inks, Picture frame, Pipe cutter, Pipe expander, Pipe wrench, Pipes and similar materials, apparatus for treating, Pitman connection, Plane, bench, Plow, Shelbourne & Sublett, Plow, C. M. Thompson, Plow beam, E. A. Wilcox, Pocketbooks, etc., elastic band for, Pole socket and neck yoke, Pot, Press, Printing machine, cylinder, Protector, Pulleys to shafts, means for securing, Pump and aerating device, beer, Quoia, Rail, detector, Railway, electric, Railway grip, cable, Railway grip, cable, J. H. Robertson, Railway signal, T. S. Nicholson, Railway switch, E. Gordon, Railway time signal, J. F. K. O'Connor, Reel, See Harvester reel.