

sawdust, and burnish the parts required to be bright; after which, the surface can be lacquered with clear shellac varnish. We do not recommend this for amateur practice. It requires some experience to bring out the work clear.

(4) B. A. asks for directions for making the composition for selfinking pad for rubber stamps. A. The usual composition consists of, 2 to 4 drachms aniline, of desired shade. 15 ounces alcohol and 15 ounces glycerine. The solution is poured on the cushion and rubbed in with a brush. Another formula includes 1 part gelatine, 1 part water, 6 parts glycerine, and sufficient coloring matter.

(5) W. M. asks (1) how to make a good root beer, similar to Hier's. A. Take 10 gallons water, heat to 60° Fah., then add 3 gallons molasses, let it stand two hours, pour it into a bowl and add powdered or bruised sassafras and wintergreen bark, of each 2 pounds, yeast 1 pint, bruised sarsaparilla root 1/4 pound, add water enough to make 25 gallons in all. Ferment for twelve hours, then bottle. 2. How to make a cherry floor stain. A. Take rain water 3 quarts, annatto 4 ounces, boil in a copper kettle till the annatto is dissolved, then put in a piece of potash, the size of a walnut, keep it on the fire for half an hour longer, then bottle for use.

(6) L. P. asks (1) how prepared gypsum for calcimining and whitening is manufactured. What is the best and cheapest way to pulverize the gypsum forming plaster of Paris, also the best way for calcining it? A. It is ground between burr stones until it is reduced to a fine powder. This is calcined by being heated in kettles or stills, the escaping water producing a movement like ebullition. 2. How can I test lime rock to tell whether it will make hydraulic lime or not? A. By testing for silica. To be a good hydraulic cement, it must contain at least 10 per cent of silica. A. 3. What is red pipe clay good for? Will it make paint if ground fine? A. Any colored oxide mixed with linseed oil can be used as a paint, but if it requires too much oil, then it is practically valueless. Pipe clay can be used for the cheaper grades of pottery.

(7) F. B. desires a good receipt for stopping a crack or small hole in a large sink. A. Take of litharge 20 parts and 1 of burnt lime in fine, dry powder. Make into a putty with linseed oil.

(8) W. C. V. asks a recipe for a good liquid blueing for laundry work. A. Take 1 ounce of soft Prussian blue, powder it and put in a bottle with 1 quart of clear rain water, and add 1/4 ounce of oxalic acid. A teaspoonful of this is sufficient for a large washing.

(9) R. S. S. H. asks: What can be done to renovate and brighten the gilt frames of pictures and mirrors that have become rusty and dingy? A. You may improve them by simply washing them with a small sponge moistened with spirits of wine, or oil of turpentine, the sponge only to be sufficiently wet to take off the dirt and fly marks. They should not be wiped afterward, but left to dry of themselves.

(10) H. C. D. writes: Can you give me a recipe for a laundry marking ink which will not wash or bleach out in the ordinary way of washing, and will flow freely from the pen, and will not need any preparation for setting it in either heat or chemical, but will be indelible from the minute it is put on the goods? A. Dissolve with the assistance of heat, 20 parts of brown shellac in a solution of 30 parts of borax in 300 to 400 parts of water, and filter the solution while hot. Then add to the filtrate a solution of 10 parts of aniline black soluble in water, three-tenths parts of tannin, one-tenth part of picric acid, 15 parts of spirit of sal ammoniac, and one-quarter ounce of water. To purify water see the "Purification of Drinking Water by Alum," contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 491.

(11) H. L. H. asks if there is anything which will positively remove large moth patches or freckles from the face, without injuring the skin. A. There is probably nothing known that will positively eradicate freckles. Among the many cures recommended, the following has the merit of being harmless: Dissolve three grains of borax in 5 drachms of each, rose water and orange flower water.

(12) W. V. B. writes: I have quite a little silver dissolved in a solution of cyanide of potassium, which has been used for electroplating. How can I obtain the silver either as a nitrate or chloride, and will it be pure enough for photographic purposes? A. Precipitate with the battery and dissolve in nitric acid.

(13) F. K.—Asphaltum is the only gum we know of that will withstand the action of nitric acid.

(14) E. H. S. & Sons ask how glass is silvered. A. For this purpose a large, perfectly flat stone table is provided. Upon it is evenly spread a sheet of tin foil without a crack or flaw. This is covered uniformly to the depth of 1/4 inch with clean mercury. The plate of glass, perfectly cleansed from all grease and impurity, is floated on to the mercury carefully, so as to exclude all air bubbles. It is then pressed down by loading it with weights, in order to press out all the mercury which remains fluid, which is then received in a gutter around the stone. After about twenty-hours it is raised gently on its edge, and in a few weeks it is ready to frame.

(15) L. T. S. asks for a liquid glue containing no acid. A. Liquid glue may be made by dissolving glue in nitric ether. The following formula is stated to be very good: 1 part sugar is dissolved in warm water, 1/4 part slaked lime is added, it is kept at 145°-155° Fah. for some days, with occasional shaking, and is then decanted. 1 part of glue is dissolved in 4 or 5 of above clear solution, to which 2 to 3 per cent of glycerine and a few drops of lavender oil are to be added.

(16) W. A. P. asks the cheapest, simplest, and most practical way for an amateur to make a furnace to melt from 5 to 10 pounds of brass for casting. A. You can easily melt 5 to 10 pounds of brass in a blacksmith's forge. Use a blacklead crucible of the proper size. Build a fire chamber around the tuyere 2 1/2 times the diameter of the crucible, with fire brick, or common brick if you have no fire brick. Use no

mortar. Bank around the outside with forge ashes or cinder. Set the crucible 4 or 5 inches above the tuyere on the fire and fill in all round, and cover with a large piece of charcoal. Put in the metal after the fire is started. Keep the crucible lifted to its proper place as the fire settles. Do not blow too hard, nor heat the metal so hot as to boil it, which makes it spongy. Use a little powdered charcoal on the surface of the metal while melting, to keep it from oxidizing. Blow the charcoal off with a hand bellows when ready to pour.

(17) A. M. M. has a quantity of spoiled dry plates, and asks how to save the silver in the films. A. To recover the reduced silver, first get off the gelatine film by immersing the plates in a weak solution of hydrofluoric acid and water, dropping each film, as it is easily pulled off the glass, into a deep porcelain evaporating basin. Cover the films with hot water, then add a few crystals of common washing soda sufficient to make the solution alkaline, bring it to a boil, and stir well until the gelatine in the films is dissolved. No change of color will be observed until a small quantity of sugar is added. Then the solution first turns gray, brown, and finally black; continue the boiling for 15 minutes. Rest the solution for a few minutes, then extract a little of the black sediment in the bottom and test its solubility in nitric acid. If it does not dissolve completely, continue the boiling for half an hour, adding a little more washing soda. When it is found to readily dissolve in nitric acid, then pour off the brown colored supernatant fluid, and replace with water. Stir up the sediment so it may be well washed, and allow the sediment to settle. Continue washing in this way two or three times until the supernatant water is quite clear. Then the mass of silver sediment is converted into nitrate of silver by the cautious addition of dilute nitric acid. If the same is added too rapidly, the frothing up of the mixture liable to cause loss of silver. When the sediment is all dissolved, we have a solution of nitrate of silver, which should be evaporated to dryness over a sand or water bath. Afterward the crystals may be redissolved for use in making silver solutions. While useful, more especially for emulsions, this process may be used for films. 2. Why do ferrotype plates have a bluish color when taken out of the sensitizing silver bath? A. A bluish film is due to a bath too strong for the collodion, too cold a temperature of the bath, or because it is a new bath insufficiently iodized. A single solution for developing dry plates that will keep may be made as follows: Sulphite sodium (chem. pure) crystals 4 oz., warm distilled or melted ice water 6 oz.; when cooled to 70° add sulphurous acid water (strongest strength obtainable) 3 oz., pyrogallol 1 oz., carbonate of potash (chem. pure) 1/4 oz. The weights are avoirdupois, or 437 grains to the ounce. Place one and a half drachms of the above solution in a graduate, and fill with water up to two ounces, then pour the developer over the plate. Development should commence in less than a minute. In case the plate is underexposed, add half a drachm of the solution at a time, until the development proceeds faster. If the image flashes out quickly from overexposure, dilute the developer at once with a large quantity of water. The developer may be used on three or four plates in succession, and should then be thrown away. Keep the bottle of mixed developer well corked. The solution will work well as long as it is not thick and muddy.

(18) G. P. S. says: May we ask you to state in your paper the greatest distance which a projectile has been thrown from any gun—cannon—now manufactured? A. We believe the greatest range attained has been by means of the De Bange cannon—11 miles.

(19) J. F. M. asks if an iron or steel bushing one-eighth of an inch thick, made to drive in a brass hole, would have a tendency to get loose by heating to a cherry red heat, or could a brass bushing be used in an iron hole? A. The bushing will not remain tight after heating. The brass expands more than the iron, as 3 to 2. If the brass is inside the iron, it will be quite loose. If an iron bushing is driven in brass, it will be moderately tight after heating, because the brass expands away from the iron by heating and returns into contact by cooling.

(20) A. S. asks what material is used in laundrying cuffs and collars, to make them so glossy. A. The simplest preparation consists of the following: Pour a pint of boiling water upon 2 ounces of gum arabic, cover it, and let it stand overnight. Use a tablespoonful of this.

(21) A. M. desires (1) a receipt for a good cheap liquid stove polish. A. See answer to query 5 in SCIENTIFIC AMERICAN for November 12, 1887. 2. A preparation that will remove moss dirt and discolorations from marble. A. Mix quicklime with strong lye, so as to form a mixture having the consistency of cream. Apply it immediately with a brush and allow to remain for a day or two, and then wash off with soap and water.

(22) J. S. K. asks: 1. What is the composition of the enamel which is applied to bicycles? A. It is japan varnish. 2. A liquid to apply to a rubber coat which has been so damaged by heat that it is not waterproof? A. Coat it with a solution of rubber dissolved in carbon disulphide. See the article on this subject in SCIENTIFIC AMERICAN SUPPLEMENT, No. 251.

(23) R. M. D. asks a receipt for making a harness grease. A. Try the following: 1 quart neat's foot oil, 4 ounces beef's tallow, and 3 tablespoonfuls lampblack; add 4 ounces beeswax for use in summer weather.

(24) O. J.—See Notes and Queries, No. 4, May 28, 1887, and No. 17, March 12, 1887, about polishing agates, geological specimens, etc.

(25) J. A. G. asks how to manufacture a metallic paint from magnetic iron ore. A. The ore may be ground, dried, and mixed with linseed oil.

(26) J. B. R. wishes (1) a receipt for a cement for putting a leather facing on an iron wheel rim for a friction gear to scroll saw. A. There is nothing better for gluing leather to iron than good tough glue with a dozen drops of glycerine to the half

pint. The pulley or rim should be made perfectly free from oil and dirt and the face thoroughly scratched over with a file. Then treat with nitric acid 1 part, water 1 part, for a few minutes, to deaden the surface. Wash with hot water to free the surface from acid. Scarf one end of the leather band; glue and draw tightly around the rim, lap the thick end over the scarf and clamp. Afterward trim the surface even. 2. A receipt for a cement for putting a wood veneer face on an iron saw table. A. The same kind of glue is the best for veneer on iron, but nothing will withstand the ultimate shrinking of wood on iron, it is too rigid; better make the saw table facing thick enough to put on with flat head machine screws.]

(27) D. & H. ask the process and how to make solution used to color bronze hinges, locks, etc., a rich brown, the color of confectioner's chocolate. A. For a dipping brown, use to 1 pint of water 5 drachms perchloride of iron. The articles must be made perfectly clean and dipped in the hot solution until the required color is obtained; then dipped in clean hot water, dried, and lacquered. If only a varnish is required, use clear shellac varnish colored with dragon's blood, gum, and burnt amber.

(28) G. V.—For painting tin roofs use red oxide of iron (Prince's metallic paint) mixed with boiled linseed oil. Temper the color with lampblack if a darker color is required, or with white lead for a lighter color. If necessary to facilitate spreading with the brush, add a little spirits turpentine. This paint is tough, holds well, and if neatly done looks well. Coal tar paints are sometimes used, but are liable to chip in cold weather.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

November 22, 1887,

AND EACH BEARING THAT DATE.

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

Table listing inventions and their patent numbers, including items like Air ship, Amalgamator and separator, Ammonia apparatus, Ammunition equipment, Animal power, Animal releasing device, Animal trap, Axle box, Back band hook, Bag, Baling press, Bar, Barrel opener, Battery, Bearing, anti-friction, Bearing, tumbler, Bancroft & Lewis, Bed bottom, spring, Bed, folding, Bed, sofa, Bed, sofa, E. Yeoman, Bed, spring, E. Oberndorfer, Beds, invalid attachment, Bell, G. W. Goff, Bleaching potatoes, Feathers, Blind, inside, F. Keller, Board, See Game and advertising board, Boiler, See Steam boiler, Boiler cleaner, automatic mechanical, Boilers, means for and method of making corrugated headers for water tube, Book clasp, Books, manufacture of illustrated, Boots or shoes, manufacture of, Bottle cap, Box, See Axle box, Journal box, Box fastener, Sumner & Moser, Brace, See Shoulder brace, Brake, See Car brake, Locomotive driver brake, Wagon brake, Bran duster, Bread, A. Schrader, Bridle blinder, Brooch pin, Broom clamp, Broom holder, Buckle or fastening for suspenders, Bung, M. R. Maher, Bung, vent, G. Morrill, Bustle, G. O. Schneller, Bustles, hinge and tip for twin wire stays for, Butter, making a compound resembling, Button and fastener holder, Button fastener, Buttonholes, staying, Button, stud, lock, L. B. Byrne, Buttons, making parts of, Car brake, Car coupling, Car coupling, G. J. Selk, Car brake and starter, Car heater, railway, Car heating appliance, Car, motor, Car, railway, Car, safety, Car starter, Car wheels, machine for making rims of, Kirby, Car window screen, Cars and similar structures, apparatus for heating, Cars, apparatus for heating and ventilating, Car dust preventing apparatus for railway, Car heating device for railway, Carpet stretcher, Carpet stretcher, A. McFarland, Cart, road, M. Barnes, Cartridge shell, Carriage irons, machine for upsetting, Carriage top irons, machine for rolling, Carriage top irons, machine for upsetting, Carriages, parasol holder for baby, Case, See Violin case, Casting machine, Casting pipes, mould for, Cattle horn tip, Centrifugal machine, Chain, drive, Chain making machine, Chain wrench, M. Quinlan, Chair, G. M. Fiske, Chair seat, B. J. Buckman, Check, draught, or money order, Churn, Backster, Jr., & Reiff, Cigar bunching machine, Cigar cutter, Clamp, See Broom clamp, Rope clamp, Clamping device, Clasp, See Book clasp, Suspenders clasp, Cleaner, See Boiler cleaner, Flue cleaner, Clock, W. D. Chase, Clock, pendulum, H. O. Deuss, Clock striking mechanism, Clutch, E. L. Babcock, Clutches, safety lever for, Cock, injector feed, Coffee roaster, Collar pad, horse, Concentrator, Conformer for thumbs, Cooler, See Milk cooler, Cop tube machine, Copying press, Cord and rope, machine for making, Core bar, collapsible, Corkscrew, E. Becker, Corset stiffening, Coupling, See Car coupling, Electric coupling, Shaft coupling, Crate fastener, F. R. Fisher, Crate fastener, Fisher & Robbins, Cross head, E. Hill, Cuff holder, E. C. Frank, Cultivator, D. J. Williams, Cultivator, W. C. Barker, Cultivator coupling, Cultivator, seeder, planter, and fertilizer distributor, combined, Curtain fixture, T. McGuire, Cutter, See Cigar cutter, Dental pliers, J. J. R. Patrick, Desk, T. C. Read, Display stand, A. Eske, Discount measuring glass and bank note examiner, combined, Ditching machine, Door check, G. A. Howard et al., Door check, S. Wallace, Drilling machines, feed mechanism for, Electric coupling, G. W. Taylor, Electric machine, dynamo, T. A. Edison, Electric motors and generators, prevention of sparking in, Elevator, See Hay or straw elevator, Portable elevator, Elevator and fire escape, Engine, See Steam engine, Expansion joint, Extractor, See Tent pin extractor, Fabric, See Woven pile fabric, Fatty substances by electricity, apparatus for purifying and separating, Feed water heater, Fence, J. M. Bosart, Fence, A. J. Yarlot, Fence post, metallic, L. Turnberger, Fence, wire and picket, Fence wire twisting and spooling machine, spur wheel, C. C. Hill, Fences, strip for metal, Fencing, machine for making spur wheel, Fender, McCoy & McArthur, File, paper, E. E. Webster, Firearm, magazine, A. Burgess, Fire escape, W. C. Chamberlain, Fire escape and water tower, Fire extinguisher, L. S. Lewis, Fire extinguisher for railway cars, automatic, Matlock & Fritz, Fire kindler, J. S. Maltby, Flue cleaner, H. Kees, Flue cleaner, E. L. Mansfield, Fluid heating and cooling apparatus, Folding machines, plaster attachment for, Foot power, J. H. Purdy, Frame hanger, adjustable, Fuel, process of and apparatus for producing and consuming gaseous, Furnace, See Smoke consuming furnace, Furnaces, attachment for boiler, Gauge, See Micrometer gauge, Galvanic battery, Game and advertising board, combined, Gas heater water back, Gate, See Railway gate, Swinging and folding gate, Generator, See Steam generator, Glass, apparatus for cutting bevels, Glass bending and annealing furnace, Glove, D. S. Morrison, Glove fastener, D. A. Carpenter, Governor, steam and gas, Grain binder, E. A. Peck, Grain meter and register, automatic, Grain polisher, J. Paul, Grain register, F. Stanton, Grain separator, J. F. Hatfield,