

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Samples of H. W. Johns' improved Asbestos Steam Packing will be sent free to inquirers. H. W. Johns Mfg. Co., 87 Maiden Lane, New York.

Lehigh Valley Emery and Corundum Wheels are acknowledged to be the safest, freest cutting, and most durable wheels in use. Write for prices, stating sizes you use. L. V. E. W. Co., Lehigh, Pa.

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For Sale—A Second-hand 6 Horse Engine and Boiler W. W. Oliver, Buffalo, N. Y.

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Steel Stamps and Pattern Letters. The best made. J. F. V. Dorman, 21 German St., Baltimore. Catalogue free.

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Abbe Bolt Forging Machines and Palmer Power Hammers a specialty. S. C. Forsyth & Co., Manchester, N. H.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y. For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

For Mill Mac'y & Mill Furnishing, see illus. adv. p. 185.

Send for Pamphlet of Compilation of Tests of Turbine Water Wheels. Barber, Keiser & Co., Allentown, Pa.

Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N. J.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock, 80 to 88 Market St., Chicago, Ill.

Wood Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Vocom & Son's Shafting Works. Drinker St., Philadelphia, Pa.

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited. Erie, Pa.

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List 27.—Description of 3,000 new and second-hand Machines, now ready for distribution. Send stamp for same. S. C. Forsyth & Co., Manchester, N. H. and N. Y. City.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y.

Improved Skinner Portable Engines. Erie, Pa.

Draughtsman's Sensitive Paper. T. H. McColin, Phila., Pa.

C. B. Rogers & Co., Norwich, Conn. Wood Working Machinery of every kind. See adv., page 206.

Cope & Maxwell Mfg. Co.'s Pump adv., page 204.

The Sweetland Chuck. See illus. adv., p. 206.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vice, Taylor, Stiles & Co., Riegelsville, N. J.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch. Phil.

Common Sense Dry Kiln. Adapted to drying of all material where kiln, etc., drying houses are used. See p. 205.

Ball's Variable Cut-off Engine. See adv., page 221.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'rs, 23d St., above Race, Phila., Pa.

Peck's Patent Drop Press. See adv., page 220.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Co., Buffalo, N. Y.

Paragon School Desk Extension Slides. See adv. p. 222

Blake's Belt Studs. The strongest and best fastening for rubber and leather belts. Greene, Tweed & Co., N. Y.

Brass & Copper in sheets, wire & blanks. See adv. p. 221.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa. can prove by 15,000 Crank Shafts, and 10,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Diamond Drills, J. Dickinson, 64 Nassau St., N. Y.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 222

Gould & Eberhardt's Machinists' Tools. See adv., p. 238.

Granville Hydraulic Elevator Co., 1193 B'way, N. Y.

Heavy Trimmed Walrus Leather, by the Hide or in Wheels, for Polishing Metal. Greene, Tweed & Co., N. Y.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St., N. Y. Wm. Sellers & Co.

Combined Concentric and Eccentric Universal and Independent Jaw Chucks. The Pratt & Whitney Co., Hartford, Conn.

Saw Mill Machinery. Stearns Mfg. Co. See p. 221. Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever. Supplee Steam Engine. See adv. p. 221. Patent Key Seat Cutter. See last or next issue.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) F. H. W. asks: What are the component parts of Belvedere metal? I judge it is a patent. A. It belongs to what is known as the sulphur sulphides—prepared by fusing certain metallic sulphides (as pyrites marcasite) or chalcopryite with a suitable quantity of sulphur. See Spence metal, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 222.

(2) G. M. S. writes: I have a standard saw mill, 66 inches bottom, 30 inches top saw, 26 feet fall, and 25 inch American turbine; speed 250 per minute. Can I, by using one pair of bevel wheels, couple directly to saw mandrel, and run as well as from drum with belt? A. No; the velocity of the wheels would be so great that they would be very noisy and wear out rapidly.

(3) C. F. W. asks: 1. If the exhaust of a five horse power engine be turned into a tank about two-thirds full of water, would it lessen the power of the engine? If so, how much? A. Yes, the increased resistance would be that due to the head of water above the pipe—one pound per square inch to every 26 inches head. 2. Would the steam arising from the surface of the water, in tank, be as great and expensive as the exhaust, even though the water was as warm as steam can heat it? A. The total quantity would be the same, if you make no allowance for that required to keep up the temperature of the water; but escaping from a much larger surface it would appear only as a vapor.

(4) F. C. S. asks: Do you know of anything that will produce a growth of hair on head or face of man? A. Subcutaneous injection of small quantities of the salts of pilocarpine has lately produced some remarkable results in stimulation of and altering the color of hair.

(5) L. M. L. writes: I was greatly interested by an article on "Silk Raising in the South," from the Louisville Courier Journal, that appeared in the SCIENTIFIC AMERICAN of the 11th instant. May I ask your advice on the following points? 1. Would you advise a woman with a small sum of money, say four hundred dollars, to buy a small piece of land, plant mulberry trees, and go into the business of silk culture? A. No. At present the business offers inducements only to such as have suitable waste land and spare time which they wish to make productive. 2. Could a person make a living by it? A. No. The silk harvest provides employment but for about six weeks, and the number of worms that one person can care for is too small to make the business largely remunerative. Even in China, where labor is cheapest, the silk harvest is profitable mainly because it fills the space just preceding the tea harvest, when there would otherwise be nothing to do. 3. What latitude or what States are best adapted to the business? A. The mulberry thrives almost everywhere in the United States, and silk worms can be raised wherever the mulberry grows. The season is longest in the Southern States, and three broods of worms a year can be raised there against one brood in New England and two in Pennsylvania. 4. Could it be made profitable by combining with it the cultivation of small fruits and rearing of poultry? A. It might be, though poultry requires most attention about the time of the silk harvest. 5. What place would be suited to make these combined occupations profitable? A. Probably in proximity to city markets, especially where good soil for gardening can be had near cheap land for the poultry and the mulberry bushes. 6. How long does it take the mulberry to grow large enough to afford food for the silk worm? A. Four or five years, from seed; three years, from good cuttings. 7. Could a place be found with the trees already growing on it? A. Probably not, though it would not be hard to find trees enough almost anywhere to experiment with. The Women's Silk Culture Association of Philadelphia sell mulberry cuttings, and also eggs for experimental cultivation. The chief promise of silk culture in this country arises from the circumstance that many women have unoccupied time which might be pleasantly employed in this way. It is a home employment that requires but little outlay, and though the product of individual effort may be small, say from \$25 to \$100 a season, it will be for the most part clear gain.

(6) D. T. E. asks: 1. How is the fine finish put on gold and silver articles such as on the inside of watch cases, etc.? A. Usually by means of suitably shaped burnishing tools made of bloodstone and hard polished steel. 2. How is the cyanide of gold made, and how is gold solution prepared? A. See electro-gold deposits in SUPPLEMENT, No. 310. 3. What is meant by gold rolled plate, and how is it put on? A. A bar or strip of base alloy has soldered to it a thin sheet or foil of gold, and the bar or strip thus covered is passed repeatedly

between heavy rollers until it is spread out into thin sheets or rods, every part of which retains a gold surface plating. During the rolling operation it is necessary to frequently soften the metal by annealing.

(7) G. L. F. asks: 1. Is water-glass known by any other name? I have asked for it, but the druggists don't know what it is. A. Water-glass is generally supplied to the trade under the names of soluble glass or silicate of soda. 2. In using the stereotype composition known as Jamin's cement, I find it adheres very firmly to my plaster of Paris moulds. How am I to avoid it? A. Try oiling the mould slightly.

(8) A. C. asks: Can you suggest some mode to remove from a large pane of glass a film or cloud, which I cannot account for. It is not in the glass, but on the surface. Have tried ammonia and whitening, also rottenstone, but failed to remove. A. Slightly moisten finest rouge with water, and apply with a chamois leather cushion, rubbing it in every direction until the film has disappeared and the glass is glossy.

(9) F. C. writes: I have made a cement of bisulphide of carbon and crude rubber, but cannot get it to stick. What is the matter? A. Gently warm the parts to be joined, smear them with the clear cement, and press the parts strongly together, continuing the pressure until the solvent has escaped. You will then find the pieces firmly cemented. See SUPPLEMENT, No. 158, for receipts for better cements. 2. Please give directions for making a good Galilean telescope and night glass. What should be the diameter and focal length of object glass and eyepiece? A. You will find a good paper on telescopes in SUPPLEMENT, Nos. 1 and 252.

(10) J. C. H. asks: What is the best method of copying engravings in ink from paper on glass? A. Try the following method: Flow the glass plate with good photographer's negative varnish thinned down somewhat, and when this has partly dried (so that the varnish will not run into the paper) lay the smoothly printed side down upon the varnished surface, and put it under slight uniformly apportioned pressure for twenty-four hours. Then moisten the back of the paper, and by means of a piece of soft rubber rub off the softened paper. If this is done with care the inked lines will remain attached to the varnished glass surface. As the thin varnish is quite transparent, this is equivalent to transferring the engraving to the glass surface. The transfer is frequently improved in appearance by giving the plate (and transfer) a second coat of the varnish. For lantern purposes it is better to cover the surface bearing the transfer with a second plate of glass, and bind the edges with thin cloth or stout paper.

(11) S. M. S. asks: Could you give me a good formula for producing a fine gloss on photographs? A. The beautiful gloss called enameling is produced as follows: After the prints have been toned, washed, and trimmed in the usual way they are immersed in a warm filtered aqueous solution of gelatin of about the consistency of collodion, to which is after added a small quantity of sugar candy. When the paper has become well impregnated with the liquid the pieces are removed and placed, smooth face downward, upon a plate of glass previously coated with a four per cent normal collodion, and air dried. In placing the print care must be taken to quickly press out all air bubbles. Afterwards a sheet of stout white paper, cut somewhat larger than the prints, is cemented to the back of each photograph to protect the pictures in the event of their spontaneously leaving the glass on drying. The plates are allowed to remain overnight in a dry locality, when the portraits may be separated from the glass by making an incision of the film all around the paper.

(12) J. B. asks: 1. Can you inform me of the chemical composition of the stone called the "Lake George diamond"? A. So called "Lake George diamonds" are commonly small, well formed, clear quartz crystals, backed with or mounted over bits of silver foil. Quartz crystals are native crystallized silicic acid. 2. How does its hardness compare with the diamond? On a scale of 10 the hardness of quartz is 7, of the diamond 10. Do these stones always retain their brilliancy, and are they still found? A. No. Quartz crystals are of very common occurrence in some localities. 4. What are its distinguishing qualities from the genuine stone? A. The chief distinguishing features are the difference in hardness, as above noted, the difference of specific gravity (that of quartz being 2.6 and of the diamond 3.48), and the crystalline structure. Consult Dana's Mineralogy.

(13) G. K. T. writes: While experimenting with electric batteries, I had occasion to use a common flower pot for a porous cup. To fill up the hole in the bottom of the pot, I poured in a small quantity of melted tar. When nearly hard I pressed the tar firmly on the inside and outside of the bottom of the pot, thereby pressing the tar firmly into the hole. After using it in the bichromate of potash battery three weeks, I removed the pot and found the tar drawn into the pot to the extent of half an inch. What caused it? Did not the heat and resistance of the current draw it in? A. The reaction of acid and water is very frequently sufficient to warm a liquid so as to soften tar. When the column of liquid in the outer jar is greater than in the porous cup the pressure is naturally inward. It is very improbable that electricity had anything to do with softening or displacing the tar.

(14) C. B. T. H. writes: There is in this city a company manufacturing wagon, carriage, and sleigh material, etc., running from fifty to sixty wood working machines (saws, planers, stickers, mortisers, etc.). When the machines are all running, the engine will lag with 80 pounds of steam. The engine is 18x28 inches, runs 85 revolutions per minute; common slide valve, cuts off at 22 inches; band wheel 10 feet diameter, weight 3 tons; fly-wheel 14 feet diameter, weight 6 tons. 1. How much power will it take to run such a fly-wheel 85 revolutions per minute? A. All the power required is that necessary to overcome the friction; the wheel consumes no power. 2. Is the fly-wheel a benefit or a damage in this case? A. A benefit. You could not run your machines without it.

(15) A. S. asks: Can you inform us through the columns of your valuable paper of a process for whit-

ening scorched larch? A. It will be necessary to sand paper the wood to remove the film of carbonaceous matter. The stain cannot be otherwise removed.

(16) V. D. G. asks: What is the best facing for heavy castings like plow beams, etc.? A. We believe powdered charcoal is considered the best facing.

(17) W. W. writes: 1. A battery of four boilers, two 15-inch flues in each, have a small steam jet in each flue at the back end to increase the draught. The boilers are 28 feet long and 42 inches diameter; smoke stack 50 inches diameter, and 60 feet high. Would it not be more economical to place a jet in the smokestack equal in size to the eight in the flues? A. Experience says no. 2. Will not the steam in the flues have a tendency to cool the gases entering the flues? A. No such effect as to be appreciable in practice. 3. The furnace is continuous, or extending the whole width of the four fronts, but the flame and gases naturally take the nearest course, and the bulk goes to the two middle boilers' flues. Would not a thin partition wall between each boiler, extending from the firebridge to the back end, remedy this evil, and by distributing the heat better, generate more steam with the same amount of fuel? A. Yes. 4. The steam from these boilers is used by a rolling mill engine, and although the engine is unusually large, still it seems under its work even with steam at 80 to 90 pounds. The steam from the boilers to the engine is very crooked, there being no less than six sharp bends and three valves between steam drum and cylinder. Will not the friction on these valves and bends greatly diminish the steam pressure by the time it gets to the cylinder? A. It will; how much will depend upon the size of the pipe in proportion to the demand for steam.

(18) J. J. C. asks: What will take nitrate of silver from woolen cloth? A. Try moistening the part first with a drop of iodine solution, and after a few minutes with an aqueous solution of cyanide of potassium, finally rinsing with plenty of warm water.

(19) N. S. C. asks: 1. Why is a salt water bath used in preparing the material for the gelatine copying pad? A. Salt water boils at a higher temperature than pure water. 2. Sometimes the material of my pad peels off and adheres to the paper while I am printing. How can this be prevented? A. Use a larger proportion of glue in the composition, or add to it a small quantity of soap.

(20) L. M. C. writes: Please give me best process for determining the CO2 in baking powders, also alum? A. For best methods of determining carbonic acid and alum in such preparations consult Thorp's "Quantitative Chemical Analysis." See also Mott's "Chemist's Manual."

(21) J. X. N. writes: In looking over my paper I see a question asked by F. M. L.: "Has there been any means devised of using as fuel the siftings or dust of coal mines?" A. Yes, they are burned successfully on the Pennsylvania Railroad by a patent process." Now, I do not know whether the Pennsylvania Railroad has any dirt-burning locomotives or not, but I hardly think they have. I do know, however, that the Reading Railroad has in the neighborhood of sixty locomotives in daily use in passenger and freight and heavy coal trains, and they are a complete success. I speak from experience, being an engineer, and having one under my control every day. This furnace is the patent of our general manager, Mr. John E. Wooten, and is, in my estimation, one of the greatest things extant. A Mogul locomotive, built by the Baldwin Locomotive Works with Wooten's patent furnace, can leave Richmond with 150 empty coal cars, run 93 miles without cleaning the fire; come down from Palo Alto, 93 miles, 145 loaded cars, without cleaning the fire, and have any quantity of steam. So I think this speaks for itself.

(22) P. J. M. asks: What heating surface should there be in a feed water heater for a high pressure steam engine, working with 75 pounds steam pressure, and making 100 revolutions per minute—that is to say, the heating surface per actual horse power; and to what degree of heat will such heating surface heat the water? A. There is no established rule for the surface of feed heaters, nor can there be, so long as the difference is so great in quantity of water used in different boilers, varying from 18 to 35 pounds per horse power. The usual proportion is three-quarters to one square foot per horse power; but a larger proportion would be better.

(23) A. C. S. asks: Will you be so kind as to give the preparation of the blue process paper that is used for copying tracings? A. Dissolve in 8 ounces of distilled or pure rain water 1 1/2 ounces of pure ammonio-citrate of iron, and in a separate vessel 1 1/4 ounces of pure ferricyanide of iron (red prussiate) in a similar quantity of water. Mix these solutions and keep in a yellow bottle or in the dark for use. To sensitize the paper moisten it uniformly with this liquid by means of a soft clean sponge, and suspend it in a dark room to dry. When dry it is ready for use. To preserve it for use it must be kept from the light.

(24) A. M. writes: A short time ago I drew some plans on tracing cloth, and colored portions of them on the back with Faber's wax crayons, red, dark blue, light blue, and light yellow. I afterward had occasion to strike off some copies by the "blue process." They gave clear impressions, but where I had used yellow, the copy showed white; where red was used, very pale blue; while the blue crayon appeared to afford no obstacle to the passage of the actinic rays, the proof coming out full deep blue the same as the portions under the clear white cloth. What is the explanation of this? A. As the actinic rays reside mostly in the upper (blue or violet) end of the spectrum, and as yellow and red transparent (or translucent) media intercept the greater portion of the blue or violet rays the cause of the non-printing (or weak printing) is obvious.

(25) C. M. K. asks: Will you please inform me of what the "vitalized air" is composed of which dentists use to deaden pain? A. Probably you refer to the anesthetic laughing gas or nitrous oxide. This gas is an oxide of nitrogen, usually obtained by heating pure ammonium nitrate to the point of decomposition in a retort.

(26) T. J. J. asks: How can I preserve a boiler when not at work, for instance, one used in the harvest field for thrashing? It is only used a few months in the summer, and perhaps once every month or two during the winter, and the balance of the time it is corroding and wasting away. It is my judgment that a boiler used so will not last as long as if used all the time. Is it so; and if so, how can I treat it? A. To lay up a portable boiler out of use, blow out or otherwise empty the water from the boiler thoroughly while the iron is warm, so it will dry off inside. Take off a hand hole plate, and (if no man-hole plate) take out the safety valve so as to permit a circulation of air through the interior. Take out the grate bars, and thoroughly clean off the ashes and soot from all parts of the furnace walls and the interior of the tubes. Store the boiler in a dry shed or barn, with the chimney stack standing, or in a dry place with an umbrella hood over the top of the stack, so that dry air will draw through the furnace and tubes.

(27) S. P. W. writes: I am in need of information. I wish to find out how to color wood black entirely through—for instance, knife handles. I have tried and failed. I wish to make maple black enough for knife handles, and have the color so that they can be finished to look something like ebony. They are all cut into about the sizes that are required. A. Steep in a strong boiling aqueous solution of logwood extract for several hours, and then for twenty-four hours more in a strong hot solution of sulphate of iron.

(28) J. F. writes: Please advise us if you can name some process whereby we could make our own carbon paper. We use large quantities, and it comes very expensive buying it from stationers. A. Clear lard, 5 ounces; beeswax, 1 ounce; Canada balsam, one-tenth ounce; lampblack, q. s. Melt by aid of heat, and mix. Apply with a flannel duster, removing as much as possible with clean woolen rags.

(29) L. N. writes: I have a telephone from my house to that of a friend. The diaphragm is made of tough animal tissue, or drumhead. I formerly used a string for the line, but it was constantly getting out of repair, on account of the different conditions of the atmosphere. I tried wire, but it rings so I cannot understand. I stuffed it behind the diaphragm, and inserted a soft substance between the diaphragm and the tin fastening of the wire, and yet it does not work perfectly. I think the diaphragm is too sensitive. What must I do for it? A. Try small wire cable cord.

(30) G. H. writes: I wish to patch a blacksmith's bellows. What is the best cement for gluing such work? A. Use rubber cement. See receipts in SUPPLEMENT, No. 158.

(31) S. A. H. asks: 1. What is the shade of green on inclosed sample, and how can I obtain a shellac lacquer for tin? A. The colorant of the lacquer appears to be Frankfurt or Scheele's green—an aceto-arsenite of copper. When in a fine state of division it mixes readily with shellac lacquer. It can be replaced to advantage by some of the aniline or coal tar greens, soluble in alcoholic liquids. 2. Can gold be deposited in various colors, say green, red, purple, etc., by galvanism? And if so, can the same be done with other metals and their alloys, such as brass, etc.? Please refer me to some work giving practical instruction for obtaining the various colors in this way. A. Yes. See "Electrometallurgy," in SUPPLEMENT, No. 310. Fev of the brighter colors can be obtained with the base alloys. 3. What is the best lacquer, and how applied, to give articles of brass, such as mountings for optical instruments, etc., the appearance of gold? A. The lacquer to be used depends somewhat upon the color of the brass: for a light brass a dark lacquer is required, and vice versa. The following are good receipts for some of these lacquers: 1. Seedlac, dragon's blood, annatto, and gamboge, each 4 ounces; saffron, 1 ounce; wine spirit, 10 pints. 2. Turmeric, 1 pound; annatto, 2 ounces; shellac and gum juniper, each 12 ounces; wine spirit, 12 ounces. 3. Gamboge, 1/2 ounce; aloes, 1 1/2 ounce; shellac, 8 ounces; wine spirit, 1 gallon. For other formula, see page 209, vol. xlv. See that the finished articles are clear, heat them as hot as the hand will bear, and distribute the lacquer quickly with brush or rag at one operation over the surface. When the articles are small they require to be heated in an oven to harden the lacquer. Several coatings of a thin lacquer give the best results. 4. How is the lacquer made and applied on the gilt moulding known as lacquer moulding, the leaf used in making it being tin foil? A. The lacquer ordinarily employed is composed of an alcoholic shellac solution colored with turmeric and annatto. 5. Is sheet zinc as pure as the commercial (cast) zinc found in the market in the shape of slabs and pigs; or is the sheet alloyed with lead or other metal; and if so, in what proportion? A. No; it usually contains small quantities of antimony and lead. 6. When impure zinc is used for a gravity battery, may the difficulty be overcome same as in the Grove battery, by keeping the zincs amalgamated, or will the mercury be likely to drop from the zinc on to the copper and interfere with the action? A. Amalgamation of the zinc is useless in the sulphate of copper gravity form of battery.

(32) G. C. W. writes: In your last issue you gave recipes to oxidize gold, silver, and brass. Will the same method do for iron? If not, what will; or can iron not be oxidized at all (malleable iron)? A. Iron is much more easily oxidized than the nobler metals. Plunge the clean metal for a few moments into a strong aqueous solution of ferric chloride, then rinse in water. The color may be somewhat improved by heating it in clay to low redness.

(33) W. K. asks: How can I dissolve bronze powders so that I can put it on papier mache, with a brush like varnish or paint, and after, when it is dry, can it be burnished with an agate stone, so that it looks like a gilt moulding? A. Mix the powder with thin glue size as a vehicle, this will form a good burnishing varnish. These powders cannot be dissolved and retain their properties.

(34) A. O. writes: This is a world of troubles, and I suppose you are entitled to your share. Here is one of my wife's making. She made, last spring,

about ten gallons of parsnip wine, the product of parsnips, sugar and dough of yeast cakes, spread on toast; usually after having gone through fermentation this wine gets perfectly clear, but this time it got cloudy, and so far we have not been able to clear it, although we have tried charcoal, raisins, and bicarbonate of soda. Can you recommend a remedy? A. Try the addition of a small quantity of egg albumen—white of egg—allowing the liquid to remain quiescent for forty-eight hours. Then rack off from the sediment and cap.

(35) M. A. asks: Can you tell me how to color feathers? Is aniline used? A. Use any of the soluble aniline or coal tar dyes of suitable color, usually a quarter of an ounce to the gallon of liquid (water, or water and alcohol) is sufficient. Steam the feathers or put them through boiling water before immersing in the dye beek. Usually no mordant or developer is required except for the reds or pinks. For these chloride of tin and tartaric acid may be employed as brighteners, alone or in connection with soap.

(36) T. N. writes: I have been using a 4 gallon gold solution about eighteen months. For the last two months the anodes coat over with gold. I am using one electrotype copper anode and one gold, and I do not understand why they coat over. I am using a wooden vessel, coated inside and outside with asphalt. The work plates all right. A. Your solution is probably deficient in cyanide. See "Gold Deposits," in SUPPLEMENT, No. 310.

(37) J. S. J. asks: Please give me information how to construct a small nickel plater, for plating small articles, the plates to cost as little as possible; also, information to remove rust from brass, and a polish for polishing brass and steel. A. You will find practical receipts and directions on these subjects in SUPPLEMENT, No. 310.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

Wm. F.—It is genuine nutmeg, of poor quality.—J. B.—It is pyrogallic acid.

NEW BOOKS AND PUBLICATIONS. INCANDESCENT ELECTRIC LIGHTS. New York: D. Van Nostrand. 50 cents.

No. 57 of Van Nostrand's Science Series: contains Du Moncel's and Preece's account of the incandescent electric lights (particularly Edison's) exhibited at the Paris Electrical Exhibition; with papers on the economy of this mode of lighting, by John W. Howell, and on the steadiness of the electric current, by C. W. Siemens.

A NEW METHOD OF SIGNALING ON RAILWAYS. By Sir David Solomon. Tunbridge Wells, Eng.: A. Baldwin.

Describes with some minuteness the electrical signals for railways patented by the author in 1874, with the improvements since made.

ONE OF CLEOPATRA'S NIGHTS, AND OTHER FANTASTIC ROMANCES. By Theophile Gautier. Faithfully translated by Lafcadio Hearn. New York: R. Worthington.

The translator has done his work rather better than such works is usually done. And the same may be said of the publisher. Admirers of Gautier will be pleased to see his artistic and fantastic, not to say erotic, stories in so fine an English dress.

HUBBARD'S NEWSPAPER AND BANK DIRECTORY OF THE WORLD. 2 vols. 8vo, pp. 1228 and 2591. New Haven: H. P. Hubbard. \$10. 1882.

These volumes give a vast amount of information with regard to the world's thirty-five thousand periodical publications, and the people who make and read them, together with a directory to some 20,000 American and foreign banking houses, a large number of maps, advertisements, and much statistical matter. Aside from its value to advertisers and in spite of the temporary business utility of much of the information given, the work has, as a whole, a permanent value in that it gives for the first time an elaborate census of the world's periodical literature, and thus exhibits a fairly accurate picture of one phase of human progress. The index of names fills some two hundred closely printed columns.

THE APPLEDORE COOK BOOK. New Edition. By M. Parloa. Boston: Andrew F. Graves. \$1.25.

Miss Parloa is well known in this city and elsewhere as a skillful cook and successful teacher of the art of cooking. Both qualifications are shown in the "Appledore." The numerous recipes are plainly and tersely put; and the author claims to have tested and approved them all.

REPORT TO THE STATE BOARD OF HEALTH ON METHODS OF SEWERAGE FOR CITIES AND VILLAGES IN THE STATE OF NEW YORK. By James T. Gardner. Albany: Weed, Parsons & Co. Paper, pp. 15.

Recommends the separate system of sewers for large towns with proper water supplies, and dry removal for villages, hamlets, and isolated dwellings.

ARTISTIC HOMES IN CITY AND COUNTRY. By Albert W. Fuller. Boston: James R. Osgood & Co.

A selection of sketches, showing plans and perspective views of a number of artistic villas, cottages, city homes, a church, with some interior views and explanations.

THE STRUCTURE OF THE COTTON FIBER IN ITS RELATION TO TECHNICAL APPLICATIONS. By F. H. Bowman. Second Edition. New York: John Wiley & Sons.

The first edition of this uncommonly worthy treatise was reviewed at considerable length in this paper a few months ago. The author makes the gratifying announcement in the preface to this edition that he will soon have ready a corresponding treatise on wool.

[OFFICIAL.] INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending March 21, 1882, AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired and remit to Munn & Co., 261 Broadway, corner of Warren Street, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

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