

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 the following week's issue.

I wish to buy second hand lathes, planers, drills, shapers, engines, boilers, and machinery. Must be in good order. Will pay cash. W. P. Davis, Rochester, N. Y.

Acme engine, 1 to 5 H. P. See adv. next issue. Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Screw machines, milling machines, and drill presses. The Garvin Mach. Co., Laight and Canal Sts., New York. Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv., p. 300.

Wanted—A first class draughtsman and machine designer with experience. Address C. N. J., box 773, New York.

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The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y.

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Position as superintendent or manager in a mfg. establishment; varied practical experience in important positions; fully up in duplicate mfg. and modern practice. "C," box 773, New York.

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Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(3314) Experimenters asks how the explosive used for priming cartridges is made and how applied. A. It is made by dissolving 1 part mercury in 12 parts nitric acid, and mixing the product with an equal quantity of alcohol. The liquid is heated to complete the reaction, is cooled, and the fulminate separates. It may be purified by recrystallization. In use it is mixed with sulphur and potassium chlorate or nitrate, and the mixture is secured in place by a drop of varnish.

(3315) G. A. W. writes: I have a deposit of kaolin which shows the following analysis: Moisture 11.35 Silica 46.60 Alumina 39.30 Iron oxide 3.04

I also have a deposit of marl which shows by analysis 82 per cent carbonate of lime, and am informed that a combination of the two will make a superior cement. Will you please inform me how this can be done. A. The only way to make a cement such as you describe is to grind together proper proportions of your materials, make into lumps with water, dry and burn in a kiln. You may experiment on these lines, using an ordinary fire. The result is doubtful.

(3316) H. N. Van T. asks for a recipe for making automatic shading pen ink of various colors. I wish an ink of brilliancy, drying rapidly, and waterproof. Also a recipe for adhesive ink, used in making gold, metallic and other lettering. A. The general basis of such inks is a solution of gum arabic. This is not waterproof. An approximately waterproof body is given by a solution of shellac in borax water. An alcoholic solution of shellac may be used which will be quite waterproof if otherwise satisfactory. Color with aniline colors or diamond dyes.

(3317) G. S. asks: What process shall I have to put cow's horns through, to soften, so that I can twist them in various shapes? A. Boil the horns in soda or potash lye until soft. The horn will be brittle when pressed or moulded. Or try simple boiling water.

(3318) G. E. B. asks for a recipe to make what they call chalk engraving plates, that is the white compound that is on the steel plate. A. See our SUPPLEMENT, No. 790.

(3319) W. T. V.—The bright metallic particles in the sample sent are iron pyrites of no value. We see no indications of copper pyrites.

(3320) F. J. K. and M. J. M. ask how horn workers soften horn so that it can be made into different shapes. A. The safest way is to use boiling

water. The moulds, if of iron, may be heated also by immersion in the same water. See query 3317.

(3321) G. J. H. asks how much a cubic foot of gold will weigh, avoirdupois weight. A. About 1209 pounds. It varies slightly, according to the treatment it has received, whether it is rolled or not, etc.

(3322) "Die Germania" asks for a good receipt for making printers' roller composition. A. Good proportions are 1 pound glue to 1 pint of molasses, Soak the glue in water for 24 hours, then melt with the molasses and cast in a mould previously oiled with olive oil.

(3323) W. C. P. writes: I notice in your issue of this date, page 73, the description of a static electromotor devised by Mr. Wimshurst. Is not this motor the same in action as the rotating glass globe with strips of tin foil on it, which, if I remember aright, Mr. George M. Hopkins described several years ago in his series of experiment with the Holtz machine, as published in the SCIENTIFIC AMERICAN? A. It seems to involve the same principle.

(3324) M. M. A. asks: Is there any way of patching rubber goods, such as hot water bags, etc.? If so, can you tell me what cement will do it or how to make it, one that will resist the action of hot water? A. The only effectual way to do this is to use a benzole or other solution of India rubber, apply to the surfaces and join, and then vulcanize, by Parke's cold process or otherwise. For general treatment of India rubber we refer you to "Rubber Hand Stamps and the Manipulation of India Rubber," \$1 by mail. No good cement for vulcanized rubber has yet been discovered.

(3325) E. S. desires to learn from Notes and Queries what application to the human flesh would have a tendency to enlarge or extend the same, so as to make that part appear fat, or what will hold a swelling created under the vacuum process permanently. A. Try vigorous massage.

(3326) C. M. asks for a composition for lining casks and like vessels, stoppers for bottles, etc.—For vessels and stoppers used for beers and ales, the compound not affecting or being affected by acids or other chemicals contained in those liquors. A. The ingredients are as follows: the powdered clay being omitted if the composition is not to be used for moulding stoppers: Shellac 4 1/2 pounds, resin 1 1/2 pounds, wood carbon 4 pounds, powdered clay 4 pounds, palm wax 1/2 pound. These ingredients are agitated with 1 1/2 gallons of methylated spirit, which "amalgamates all of them into a compound." Without the clay the compound is semi-liquid, and can be run or brushed over the surface to be coated, and allowed to dry.

(3327) D. D.—Waterproofing composition for stone, bricks, plaster and cement surfaces.—One pound of "gum dammar" is dissolved in 1 gallon of hot turpentine or hot mineral spirit, and 2 pounds of paraffin wax added. The paraffin dissolves, and the composition when cold can be brushed on to the surface to be waterproofed. Dirty surfaces should be first cleansed. The compound is kept in jars carefully corked.

(3328) M. T.—For furniture polish.—Mix together in or about the proportions given: Linseed oil 1 gallon, butter of antimony from 1/4 to 1 pint, as desired, spirits of wine 1/2 pint, white vinegar 1 quart, gum cassia, a few ounces.

(3329) M. S. K. writes: Southern electrical workers seem to be scarce, so I will give you my experience in this direction. I have constructed several induction coils of different sizes, among them the one described in one of your SUPPLEMENTS, but deviated from instructions by using only eight ounces of No. 35 cotton-covered wire wound in two sections, insulating each layer with three thicknesses of tea paper; sparks realized are nearly half inch in length, without condensers, using three small bichromate cells. Have made telephone and microphone described in "Experimental Science;" they work admirably. I am now making a Blake transmitter. I have also constructed batteries, bells and galvanometers of my own design, and contemplate making simple electric motors, as soon as I can get the material.

(3330) A. W. B. asks (1) for prices of the metals named. A. Vanadium \$9.979 per lb. avds. Zirconium 4.536 " " " Lithium 4.082 " " " Rhodium 2.268 " " " Iridium .906 " " "

2. Can you refer me to any work on the production of these metals? A. You will find the subject treated in manuals of chemistry. 3. What is the hardest known metal? A. Manganese is the hardest of twenty prominent metals, according to Bottone.

(3331) B. Y. S. asks: If beeswax is dissolved in spirits turpentine to the consistency of thick cream, how shall I color it white, also brown? A. White can only be produced by a solid pigment, such as Chinese white. You should start with bleached wax and the lightest colored turpentine. For brown use burnt sienna or prepare an aniline color by solution in water or alcohol and precipitation with a solution of soap.

(3332) W. P. B. writes: Will you kindly inform me through your paper if there is an artificial stone that will answer for posts and how it can be made. A. Best Portland cement 1 part, clean sharp sand 2 parts. Make a thick mortar, mix well, dump into a wooden box of the intended form of your post. The cement will be sufficiently hardened for removal from the box in twenty-four hours. To facilitate removal the box might be made of four separate pieces or staves temporarily held together with iron hoops.

(3333) G. H. I. writes: Will you please state what is the best gum to use on envelopes? A. First quality gum arabic is the best.

(3334) E. M. W. asks: 1. How can I remove rust from tin, say a tin pan used to hold copy cloths for copying letters? A. The rust cannot be permanently removed; the pan can be japanned, or

what is better, have a tinned copper pan made, which will last years. 2. How can I prepare and apply copying ink to dried-out typewriter ribbons, either blue or green? A. Typewriter ink is described in the SCIENTIFIC AMERICAN, No. 21, vol. 59, query 15; No. 22, vol. 58; No. 7, vol. 56; query 22, No. 8, vol. 56.

(3335) G. W. O. asks: What date did the 19th century commence, and what time will it expire? A. It began January 1, 1801, and will end December 31, 1900.

(3336) T. G. D. asks: In which number of your paper will I find the explanation of firing a cannon ball from a moving train? A. No explanation should be needed. The motion received by the cannon ball is composed of the motion of the train and of the motion imparted by the firing, and may be graphically obtained by the parallelogram of forces.

(3337) M. M. W. asks: 1. In what ways and for what reasons does Siemens producer gas differ from ordinary coal gas used for lighting purposes? A. Producer gas is made by incomplete combustion combined with distillation of the fuel and at the same time by decomposition of water by the hot fuel. It is characterized by the presence of large quantities of nitrogen from the air, and carbonic oxide. Coal gas is made by distillation in a closed retort of bituminous coal, contains very little nitrogen, only a few per cents of carbonic oxide, and the rest is hydrogen and hydrocarbons principally. 2. What substances are used for lighting by incandescence? A. Oxides of the earths, magnesia, limes, zirconia, and others. Some become luminescent at lower temperatures than others, and so far are desirable. Some deteriorate more rapidly than others, which is a bad feature. Many mixtures have been experimented with. 3. How may coal gas be made to give a non-luminous flame? A. By mixing air with it before combustion, as in the Bunsen burner. 4. Why is it that ammonia is found in the products of combustion of carbonaceous fuel? By what means is it extracted and obtained in a form suitable for use in the arts? A. Because the fuel contains nitrogen already combined with carbon and hydrogen. On distilling coal ammonia is evolved, and is washed out with water, whence it is extracted by heating, first alone and afterward with lime. The ammoniacal gas evolved is collected in dilute sulphuric acid, whence ammonium sulphate is produced by evaporation. 5. In what way, and why, does coal belonging to different geological periods differ? A. No very good answer can be given. The coal of the older periods is apt to be more thoroughly compacted and altered than the recent coals and lignites. The latter are nearer in character to the wood and vegetable matter from which all were originally formed.

(3338) E. J. M. asks: What is the lifting power of gas? If a cylinder, 20 feet long, 10 feet in diameter (made of steel strong enough to hold), with a pressure of 200 pounds per square inch, what would be the upward pressure, or how much would it lift? If a vacuum could be made in the same cylinder, would the lifting power be greater or less? Also, how much? A. The more gas is compressed above the atmospheric pressure, the less will it lift. At 200 pounds to the square inch, hydrogen would be almost as heavy as air, and ordinary coal gas would be about six times as heavy, so that the cylinder would fall more rapidly than if filled only with air. Pure hydrogen will lift about 70 pounds to the thousand feet, coal gas about 40 pounds. A vacuum will have slightly greater lifting power than hydrogen, about 5 pounds more to the thousand cubic feet.

(3339) W. L. V. writes: 1. I have a fine film negative which has some small red spots on it. I think that they are silver stains, caused by printing on damp albumen paper. If such, what will remove them? A. Probably they are silver stains. J. V. Drake gives the following directions to remove: Soak the film for five minutes in clean water, meanwhile make a solution of iodide of potassium, 20 grains to an ounce of water. Immerse the film in this for ten minutes. If it is an old stain, immerse for half an hour. Dissolve half a drachm of cyanide of potassium in one ounce of water. Immerse the film in this and rub the stains with a tuft of absorbent cotton until they disappear. If the stains are very old, make the solutions stronger and immerse for longer time. 2. Give a formula for reducing negatives locally. A. To reduce negatives locally dissolve 10 grains of hyposulphite of soda and 5 grains of red prussiate of potash in one ounce of water. Apply to spot with camel's hair brush.

(3340) F. W. S. writes: 1. In your issue of August 22 is not the answer to query 3282 a mistake? I have figures which show the fusing point of platinum at from 3900° to 4000° Fah. A. The figures are erroneous. It should read 3800° Fah., instead of 3080° Fah. Such temperatures are only approximate. 2. What is the highest degree Fah. which can be obtained with ordinary gas blowpipe? A. 6000° to 6800° Fah.

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 law 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

August 25, 1891.

AND EACH BEARING THAT DATE.

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

Acid, amido-oxynaphthaline disulphonic, H. Kuzel. 458,288 Acid, amido-naphthol monosulphonic, H. Kuzel. 458,285 Advertising apparatus, street, G. W. MacKenzie. 458,474 Alarm. See Burglar alarm.

Table listing various inventions and their patent numbers, including Amalgamator, Animal trap, Annunciator, Armature, Art's electrical, Axle box attachment, Baling press, Battery, Bed bottom, Bedstead brace, Bell ringer, Belt, Bench dog, Blanket holder, Blotting paper, Boiler tube stopper, Bolt or rivet heading machine, Bottle stopper, Board, Boiler, Bolt, Boots or shoes, shank stiffener, Box, Paper box, Boxes with metal clips, Brace, Braiding machine, Brake, Bridge, Broom holder, Brush, Buckle, Bunker cover fastener, Burglar alarm, Burlap, Butter cutter, Button, Cable grips, Calendar, Can, Candlestick, Car brake, Car brake, Car buffer, Car coupling, Car coupling, Car door lock, Car steam heating pipes, Car strap hanger, Car switch attachment, Cars, label holder, Cars, sand box for street, Carriage tops, Case, Cash drawer and recorder, Cash register and indicator, Ceiling plate for steam risers, Chair, Chimney, Chronological chart, Chuck, Churn, Cigar box, Cigar fillers, Cigar pipe holder, Circuit closer, Clamp, Clasp, Cleaner, Clock case, Clock, electric alarm, Clock, electric alarm, Clock, electric alarm, Cloth wringer, Clothes drier, Clothes drier, Clothing clasp, Collar fastener, Combination lock, Condenser, Conveying apparatus, Cooking apparatus, Cop or bobbin, Corn popper, Cornet, Corset, Cotton, machine for handling and cleaning seed, Cover for receptacle, Coupling, Cultivator point, Cultivator, sully, M. Burke, Cut-out, W. H. Irish, Cutter, Butter, Cutter bar attachment, Bakes & Lacey, Cutting apparatus, C. D. Hillabod, Dampening and copying appliance, J. H. Anderson, Dash board, E. M. Barnes, Decorticator of wheat and apparatus therefor, Sanderson & Reed, Dehorner, W. H. Newton, Desk, E. F. & F. D. Pooley, Die stock, J. M. Carpenter, Ditching machine, L. H. Turner, Door, air tight, J. Kennedy, Door bolt, T. Lyons, Door check and closer, E. I. Blount, Drier, See Clothes drier, Drill, See Grain drill, Drill frame, self-adjusting, J. Farmer, Drill gauge, C. H. & L. Loeb, Drum and damper for the same, stove, T. Power, Dust from air, process of and apparatus for separating, O. Kutsche, Dye, azo, H. Kuzel, Dye, induline, B. Homolka, Eggs, compound, as a substitute for yolk of, J. E. Furber, Eggs, substitute for white of, J. E. Furber, Electric clamp, E. Rasmussen, Electric clamp, adjustable, H. Lemp, Electric conductor, F. E. Gegenhardt, Electric motor, alternating, L. Gutmann, Electric motor, C. E. Egan, Electric motor, L. Gutmann, Electric motors, operating alternating, L. Gutmann, Electric signal and switch moving mechanism, J. Ramsey, Jr., Electric stop mechanism, E. Boening, Elevator, See Heating furnace. Hydraulic elevator, G. H. Reynolds, Engine indicators, gear for steam, M. S. Cabell, Envelope machine, R. Anderson, Exercising apparatus, G. Zander, Extractor, See Packing extractor, Fagot making machine, Sissons & Mayo, Farngate, A. L. Gericke, Fence post, W. M. Skellon, Fender, See Flow tender, Fifth wheel, M. Halfpenny, File, memorandum or scrap, S. G. Higgins, Filter, M. Brand, Filter, H. & W. M. Jewell, Filter, J. M. Wells, Firearm magazine, S. Burgess, Fire chamber ventilator, P. Abrahamson, Fire extinguisher, H. C. Johnson, Fishing net, Hettner & Stockel, Flour thrashing machine, T. Doolan, Flour bolt, O. M. Morse, Flour packer, M. W. Lipe, Flour receptacle, F. Schafstall, Forceps joint, F. A. Reichardt, Frame, See Drill frame, Friction joint, spring, W. J. Elliott, Fruit grading machine, J. T. Ish, Furnace, See Heating furnace. Hot air furnace. Hydrocarbon furnace, Furnace, W. Tomlinson, Furnace, G. W. & A. W. Walker, Furnace, G. W. Wood, Furnace grate, G. W. Wood, Gauge, See Drill gauge, Game apparatus, J. H. Nolan, Game apparatus, J. A. Geesaman, Game board, W. G. Bullen, Game board, H. C. Manning, Game or puzzle apparatus, C. P. Blinn, Gas lighter, H. A. Pinkner, Gas lighting apparatus, automatic, G. D. Clarke, Gas producer, C. M. Ryder, Gate, See Farm gate. Molasses gate. Railway gate.