

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion. If the Notice exceeds four lines, One Dollar and a Half per line will be charged.

Patent Double Eccentric Cornice Brake, manuf'd by Robinson & Co., successors to Thomas & Robinson, Cincinnati, O. Send for circulars.

Safety Linen Hose for Stores, Factories, Hotels and Steamboats, at best rates. Greene, Tweed & Co., 18 Park Place, N. Y.

Two valuable Patents for sale; will take good second-hand machinery in part pay. Address J. R. McCormick, Georgetown, Texas.

Eterich's Screw Cutting Tools are in great demand. Catalogue free. Frasse & Co., 62 Chatham St., N. Y.

Wanted—A thorough mechanic and practical man to act as superintendent of a large machine shop and foundry doing general work. Address, with references, R., No. 13 S. William St., N. Y.

A valuable Patent for sale. Address C. A. Corman, Cohasset, Mass.

A Book and Documents giving instructions for Selling Patent Rights; commended by Scientific American, vol. 20, page 377. We sell all kinds of blanks. Circulars free. S. S. Mann & Co., 132 Dolphin St., Baltimore, Md.

Painters.—Send for new prices of Metallic Graining Tools, for "wiping out." J. J. Callow, Cleveland, O.

For the best Galvanized Iron Cornice Machinery for all kinds of work, apply to sole owners, Calvin Carr & Co., Cleveland, O.

For Sale.—Combined Punch and Shears, and Engine Lathes, new and second-hand. Address Lambertville Iron Works, Lambertville, N. Y.

Best and cheapest Glass Oilers. Cody & Ruthven, Cincinnati, O.

Cotton Belting, light and heavy, for Polishing and Carrying Belts. Greene, Tweed & Co., 18 Park Place, N. Y.

Best Scroll and Band Saws. Cordesman, Egan & Co., Cincinnati, O.

Yacht Engine and Boiler, \$300. Box 630, Hartford, Ct.

Wanted.—To know whether the Ames Nathan Self-feeding Card Printing Press (Pat. April 22, 1862) has ever been built and sold. Address E. L. Touret, 226 W. 22d St., New York.

Chester Steel Castings Co. make castings twice as strong as malleable iron castings, at about the same price. See their advertisement on page 221.

Transit and Clock wanted—Box 913, Springfield, O.

Hyatt & Co.'s Varnishes and Japans, as to price, color, purity, and durability, are cheap by comparison than any others extant. 246 Grand st., N. Y. Factory, Newark, N. J. Send for circular and descriptive price list.

The Zero Refrigerator was awarded a grand Centennial medal. Send for book. Lesley, 226 W. 23d St., N. Y.

See Bolt's Paneling, Moulding, and Dovetailing Machine at Centennial, B. 8-55. Send for pamphlet and sample of work. B. C. Mach'y Co., Battle Creek, Mich.

Gas lighting by Electricity, applied to public and private buildings. For the best system, address A. L. Bogart, 702 Broadway, N. Y.

For Sale—One 8 H. P. Portable Engine, \$325; one 10 H. P. \$375; one 12 H. P. \$450. J. Harris, Titusville, Pa.

Catechism of the Locomotive. 600 pages, 250 engravings. \$2.50. Address M. N. Forney, 73 Broadway, N. Y.

Send for James W. Queen & Co.'s Catalogue of Drawing Instruments and Materials; also catalogue of Microscopes, Field Glasses, Telescopes, and other optical instruments. 924 Chestnut St., Philadelphia, Pa.

Power & Foot Presses, Ferracute Co., Bridgeton, N. J.

Superior Lace Leather, all sizes, cheap. Hooks and Couplings for flat and round Belts. Send for catalogue. C. W. Arny, 148 North 3d St., Philadelphia, Pa.

F. C. Beach & Co., makers of the Tom Thumb Telegraph and other electrical machines, have removed to 530 Water St., N. Y.

An English gentleman, of many years' experience, who will return to Europe in a few weeks, desires to negotiate with American manufacturers for the sale of their goods in England, France, and Germany. Address Field, care of James Littlejohn, Esq., P.O. Box 2703, New York city.

For Best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay Sts., Brooklyn, N. Y.

Lead Pipe, Sheet Lead, Bar Lead, and Gas Pipe. Send for prices. Bailey, Farrell & Co., Pittsburgh, Pa.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing metals. E. Lyon, 470 Grand St., N. Y.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, New York.

Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

Shingle Heading, and Stave Machine. See advertisement of Trevor & Co., Lockport, N. Y.

For Solid Wrought Iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.



J. H. P. will find something on images on the retina on p. 193, vol. 36.—R. S. B. will find something on iceboats sailing faster than the wind on p. 107, vol. 36.—S. E. will find something on burning gas as fuel on p. 390, vol. 33.—J. O. C. will find an article on setting wagon axles on p. 299, vol. 34.—J. J. K. will find an answer to his question as to a cannon on a car on p. 273, vol. 34. The pressure is greater on the bottom of the boiler by the weight of the contents than it is on the top.—S. will find a description of the art of taxidermy on p. 159, vol. 32.—C. C. S. will find that waterproof glue will make a watertight joint between cork and cloth. See p. 43, vol. 32.—A. F. B. can copper iron wire by following the directions on p. 90, vol. 31. To nickel iron wire, see p. 186, vol. 34.—T. E. will find a recipe for a liquid bronze for brass on p. 51, vol. 33.—J. A. R. will

find directions for making durable whitewash on p. 133, vol. 34.—F. G. T. will find a recipe for a mullage that will not mould on p. 196, vol. 34.—J. R. will find a description of the manufacture of earthenware on p. 191, vol. 32.—R. S. will find a description of a battery for plating on p. 26, vol. 32.—J. M. W. will find on p. 341, vol. 27, directions for making hydrogen. Formaking oxygen, see p. 75, vol. 32. To make carbon plates for batteries, see p. 187, vol. 32.—J. A. L.'s queries about a hole and its plug are merely questions of definition. There is nothing to be decided in them.—R. M. C. will find directions for ebonizing wood on p. 50, vol. 33.—E. H. M. will find instances of spontaneous combustion mentioned on pp. 343, 368, vol. 34.—J. W. S. will find directions for preserving eggs on p. 306, vol. 34.—A. B. C. will find instructions for tempering rock drills on p. 202, vol. 31.—A. L. is informed that we cannot answer legal questions.—R. P. P. will find something on wooden railroads or tramroads on p. 324, vol. 29.—G. A. C. will find a recipe for blackboard composition on p. 299, vol. 28.—H. A. will find directions for enameling metals on p. 203, vol. 29.—W. H. B., J. H. W., Y. I. W., J. H. N., J. L. G., G., J. McE., and others, who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) C. A. W. asks: How can light-colored kid gloves, that have become spotted with sea water, be dyed any other color than black? A. They can be dyed to any of the darker shades in the usual way. See p. 166, vol. 28.

What is the best thing with which to clean silver or silver-plated ware that has become black and will not brighten up with whitening? A. Use tripoli powder, mixed with a little olive oil if necessary.

(2) E. A. F. asks: Is there any process by which the liquid that drops from stovepipes can be removed from carpet? A. Use plenty of soap and water.

(3) J. S. S. asks: Is woolen clothing healthy? Fine soft wool, unless colored, will shrink; and cloth made from coarse hairy wool is too heavy to wear in the summer, and will irritate the skin and give those who wear it a cold in the fall when they put it on, and again in the spring when taken off. Clothes made of cotton can be more thoroughly washed and boiled than those of wool, and are they not more healthy? Is not white clothing healthier and more comfortable both in summer and winter than colored? A. As a general rule, light woolen clothing, if clean, is more healthy and a better protection against colds, from sudden changes of temperature, than cotton or other vegetable fibers. In winter, dark or black clothing is best, as it is warmer than light. In summer, light colors should be worn. Some woolen fabrics, dyed with some of the coal tar colors, when permitted to remain for any length of time in direct contact with the moist cuticle, have produced poisonous effects; but not otherwise. It is for this reason advisable to use only undyed fabrics for under-clothing.

(4) H. H., Jr., asks: Are there any chemicals by which glue can be made into a paste, to be used (cold) for closing quarter cracks in horses' feet? A. Heat the glue for some time in strong acetic acid, and evaporate in the air until of the consistence desired. Such a solution of glue will not gelatinize. It dries rapidly, forming a stronger and more flexible joint than ordinary glue.

(5) J. E. M. asks: Why is it that, in a window fitted with alternate panes of blue and white glass, the former become quite warm in the sunshine, while the temperature of the white glass remains almost, if not altogether, unchanged? A. Clear glass permits the passage of all the rays of the spectrum, while blue glass intercepts all the rays except the blue. The destruction of these luminous rays determines their conversion into sensible heat, which is absorbed and radiated from the surface of the glass. The heating effect of this absorption is intensified, from the fact that the sensible heat rays of sunlight preponderate in the lower or red end of the spectrum, which is, in the present instance, intercepted. The darker the color of the glass, the greater will be the amount of heat developed.

(6) L. H. R. says: I have a flute of 8 lever keys that was laid away for about two years; at the expiration of that time I found it so dry that all the joints were loose. I oiled it several times, so that it is now perfectly tight; but I find that I cannot blow the lower notes at all, and can only blow the upper ones with great difficulty. After wetting the inside with water, it fills perfectly easily until dry again; but I am of opinion that this operation will, in time, have a damaging effect. Can you inform me how the difficulty arose? A. The wood has probably become rough on the interior and the bore distorted by excessive desiccation. Free all the cavities from dust, and rub the instrument inside and out with a little warm glycerin.

(7) W. L. D. asks: I dissolved a bit of German silver in nitric acid in a test tube; it gave a greenish blue solution, and after diluting with water I dropped sulphuric acid into it slowly, which threw down a white precipitate. When this was completed, I immersed a copper plate, which threw down a gray metallic powder. What was the chemical action, and what were the several precipitates? A. It is probable that the alloy, or the water you added to the solution, contained lead in some form, which, combining with the sulphuric acid, produced an insoluble sulphate of lead. The deposit on the copper may be metallic arsenic from the impure nickel used in the alloy.

(8) E. C. M. says: I have a walking cane of whalebone about 1/2 inch thick; it was set with little ivory points to represent knots, but these are falling out and the bone cracks and splits. I know that this cannot be helped; but how can I prevent it from further breaking and scaling? A. Try impregnating it with a little warm glycerin.

(9) M. B. C. asks: Can I make a crucible, that will stand a white heat, of water lime or quicklime, either alone or by mixing with something, such as sand or plumbago? A. Small crucibles cut out of pure caustic lime are sometimes used; but if not heated gradually and uniformly, they are apt to crack. A crucible moulded from lime, made plastic by the addition of water, will crack and fall to powder in the process of de-

hydration, by heat or otherwise. Moulded with sand it would fuse into a hard glass at high temperatures. Plumbago cannot be formed with lime into a crucible.

(10) J. S. says: Balsam of fir will render paper translucent. Pitch does the same in a pine plank. Why is this? A. For the same reason that water, filled with bubbles of air, loses its transparency. Neither paper nor wood is a homogeneous substance; but both become nearly so by impregnation of the fibers, and filling the interstices with translucent resin.

(11) J. R. A. says, in reply to E. A. W., who asks how to remove the clinkers from stove linings: When you have a good fire, cover the coal with three inches or more of oyster shells, and let the fire burn out, and burn the shells; you will be able to remove the clinkers, without the aid of mechanical means or injury to the firebricks, on the following morning.

(12) B. H. S. asks: 1. Of what is lightning composed? A. As to the precise nature of electricity, nothing definite is at present known, other than that it is a peculiar motion, analogous to that of heat, of the atoms in their molecular groupings, within the body which is electrically excited. In the case of lightning, the clouds, the air, and the moisture which it contains, and the surface of the earth, constitute the bodies excited. It has been shown that the cause of the electrical excitation in our atmosphere is due to a disturbance of the normal statical equilibrium by the translation of aqueous vapor from the earth's surface, and its subsequent condensation in the form of clouds and rain in the cold upper regions of the atmosphere. 2. Why are metals conductors? A. The metals are generally better conductors of electricity than the non-metals, owing to some, not yet well understood, arrangement of their molecules, which facilitates the transmission of the motion throughout the material. 3. Which is the positive pole, and which the negative, of a battery? A. The positive pole, or electrode, of a galvanic battery is the upper end of or connection with the negative plate of the cell—in the Daniell's, gravity, and similar zinc-copper batteries, this is the copper; in the Bunsen, or bichromate cell, it is the carbon plate. The negative pole, in all present forms of batteries, is the zinc.

(13) L. C. J. says, in answer to J. H. W.'s query as to ice in a sand mould: I wish to inform him that the ice under his loose sand had melted to some extent, and the hot coal and iron came in contact, or his sand was insufficient, or not well packed or rammed. The safest plan is to have the floor beneath the cupola dry or comparatively so; but in the event of water or ice being under the cupola, put under the dry sand just before dropping the bottom.

(14) J. S. M. says: Having accidentally broken a small cast iron gear wheel, I tried to solder it with soft solder, using muriatic acid (diluted with an equal quantity of water, after having taken up all the zinc it would) as a flux, but the solder would not unite with the iron. I then added some sal ammoniac, but with the same result. I also tried to make a mat joint with tin foil, clamping the parts together, but it all ran out. I heated the wheel in the stove and also with the blowpipe; and after several attempts I gave the job up as a failure. Can you tell me what the trouble is? A. A. You will find it impracticable to solder your wheel together unless you galvanize the surfaces.

(15) W. H. H. says: 1. Your paper of February 10, says: "Dissolve crude rubber and shellac in naphtha." I put them separately in bottles, and set them in warm water. The rubber dissolved, but the naphtha did not. What is the reason? A. We do not understand you. Coal tar naphtha is a volatile liquid. The powdered shellac may be dissolved in it by heat and agitation. 2. How are the rubber bands sold by stationers joined together? A. By pressing the ends of the rubber band together before vulcanizing.

(16) B. F. asks: 1. The iron won from waste tin plates, even when absolutely free from tin and acids—which after chemical analysis contains no tin—gives in the blooming forge a cold short iron of little value, though the material employed for the plates must have been a very good one. Can you give reasons for this singular experience? A. A determination of the percentage of carbon in the iron would very probably reveal the cause. 2. Is there any way of treating this iron differently, so as to obtain a better material? A. It may be improved by re-puddling.

(17) R. E. B. asks: How can I prepare paper so that, when burned, it will leave a perfume similar to that from pastiles or fumigators? A. Take cascarrilla bark 8 drachms, gum benzoin 4 drachms, yellow sanders 2 drachms, styrax 2 drachms, oilbainum 2 drachms, charcoal dust 6 ozs., niter 1 1/2 drachms, mullage of gum tragacanth, sufficient quantity. Reduce the substances to a fine powder, form into a paste with the mullage, coat the paper with this, and dry in an oven.

(18) F. G. H. says: I have 25 gold fish in a bath tub. What steps shall I take to make them breed? A. The gold fish (*Cyprinus auratus*) seldom deposit spawn when kept in vases or aquaria. In order to secure a supply, the young healthy fish must be placed in reservoirs of considerable depth, in some places, at least, shaded with water lilies and constantly supplied with fresh water. When the spawn is deposited, it rises to the surface, and should then be collected and exposed to the sunlight until vivified by the heat. Care must be taken to collect the spawn as soon as it rises to the top of the water, as otherwise it will soon be destroyed by the fishes themselves. The spawning season of the fish is usually in or about the month of May. The Chinese, who bring gold fish to great perfection, feed them with small balls of paste, which they scatter into the water occupied by the fish, who greedily devour them. Large quantities of gold fish spawn are annually collected along the banks of the "great river" (Yang-tse-kiang) by throwing mats or hurdles across the current.

(19) J. J. K. asks: What is used to color maps pink, yellow, green, and pale blue? A. Use water colors diluted to the required degree of paleness, with a little ox gall mixed with them.

(20) C. A. H. asks: How can I make a galvanizing surface smooth, and crystallize it after it comes from the kettle? A. The *moiré* appearance of galvanized iron is produced by first tinning the sheet.

Half fill a wooden bath with dilute solution of muriate of tin, prepared by dissolving metallic tin in concentrated hydrochloric acid; this will take two or three days. Use 2 quarts of this solution to 300 quarts water for the bath. Put in the bottom of the bath a thin layer of finely granulated zinc, and then on it a cleaned iron plate, then a layer of the zinc and another iron plate, and so on alternately till the bath is full. The zinc, the iron, and the solution constitute a galvanic battery, and a coating of the tin is deposited on the iron plates in about two hours. Have ready a wrought iron bath containing molten zinc, covered with a layer of powdered sal ammoniac mixed with some earthy matter. In the bath, beneath the surface of the zinc, arrange two iron rollers, tightly compressed together, to be turned by a crank attached to one of them. Take the plates out of the tinning bath one at a time, drain them, and pass them while wet between the rollers in the zinc.

(21) A. E. D. asks: Can you give me any information concerning the putting up and mode of application of Turkish baths? A. The theory of the Turkish bath is to relieve the body of foul matter by creating a profuse perspiration, and then washing the skin in the usual way. Tepid water, used in the washing, closes the pores, and a cold shower or plunge bath creates a glow on the skin and stimulates the whole body. The perspiration is produced by the bather sitting in a room heated by hot dry air till moisture exudes from every pore. The matter brought to the surface by this means is frequently large in quantity.

In the SCIENTIFIC AMERICAN SUPPLEMENT, p. 774, you give an illustration of a pneumatic pen. How is the ink or color spread? A. The ink should be spread with a small brush, such as is used for marking linen with a stencil plate.

(22) J. C. asks: What isthmus, if any, connects Nova Scotia peninsula to New Brunswick? A. There is an isthmus 15 miles wide between the two countries. It has no specific name that we know of.

(23) H. M. C. asks: Given the three sides of any triangle, what is its area? A. Construct the triangle; let fall a perpendicular from the apex to the base. Base x half the perpendicular = area.

(24) B. A. F. asks: What would be the pressure in a steam boiler when the heat indicated by a thermometer is 320° Fah.? A. Seventy-five lbs. to the square inch.

(25) C. H. A. S. asks: Does the exact center of an iron shaft turn, if it be placed in a lathe? A. The center of a shaft is an imaginary line, which is stationary. Any part of the shaft that has breadth or thickness rotates.

(26) A. L. W. asks: Please give me directions for brazing small pieces of thin brass together? A. Use a solder composed of copper 1 lb., zinc 1 lb. Or one of copper 32 lbs., zinc 29 lbs., tin 1 lb.

(27) G. T. asks: What is the easiest and quickest way to make small electrotypes? A. Mould the object, previously brushed over with plumbago, in a wax made of wax 3 parts, and stearin 1 part. Brush the mould with plumbago with a soft camel's hair brush. Then deposit a coating of copper by electricity as described on p. 405, vol. 32. Back the copper deposit with type metal.

(28) J. L., of Manchester, England, asks: What are the compositions and mode of use for japanning or black enameling tea trays, coal vases, etc.? A. To make good work, the metal plate should be primed with stiff size mixed with whitening. Clean the plate, and brush the priming on, let dry, polish with fine glass paper, and apply another coat; let dry, and then smooth with a moist sponge. For a black japan ground, use shellac varnish with ivory black, using finally, for a polishing coat, seed lac varnish. Harden the varnish by means of a hot oven.

(29) J. W. B. asks: How do glass sign writers give a mirror-like finish to gold and silver letters? A. Use gold and silver leaf. Take a little fine isinglass, as much as will lie on a five cent piece, and dissolve in a little boiling water. Add as much alcohol as there is water, and strain through silk. Paint the letters on a sheet of paper with Brunswick black; fix the paper, with the writing reversed, on the glass. Use the isinglass solution as a mordant, laying it on with a camel's hair pencil, and then apply the gold leaf. Place the glass in a warm room; and when the gilding is dry, rub over with a piece of cotton wool. Pass a flat camel's hair brush, moistened with the isinglass solution, lightly over the gold letters; let the solution be hot for this operation. A second coating of gold leaf will improve the work.

(30) W. F. P. asks: How can I keep lice, etc., off geraniums? A. If the plants are in a greenhouse, fumigation with tobacco smoke is the best remedy. Tobacco stalk refuse can be used for the purpose.

(31) C. C. H. asks: How can Babbitt metal be united with cast iron in a journal box, so that it will not be loose? Can it be soldered? A. You may solder your box with ordinary solder, and then pour the Babbitt metal. A better plan is to drill small holes at various angles in the box, then pour your Babbitt in, and it will be firm. It is not unusual to rivet the Babbitt by hammering it when cold.

(32) W. H. asks: 1. How are slots in common wood screws cut? A. By special machinery. 2. Are they cut before the screws are threaded, or after? A. After they are threaded. 3. How many can be done in a day? A. It depends upon the size and the kind of machine used: from 2,000 to 20,000 per day.

(33) W. H. M. says: I have a common tinner's fire pot in which I burn common nut coal, as there is no charcoal to be had here. Placed horizontally through the fire pot are two sheet iron tubes about 1 1/2 inches in diameter, into which I place my soldering irons to be heated. I find, after heating them two or three times, that a scale forms on the copper tips, so that they have to be tinned several times a day. Can you tell me the cause of the scale forming on them, and how I can prevent it? A. Your soldering irons either get too hot, or else your solder is not fine enough.

(34) J. C. K. asks: Which is the most economical motor to drive a small lathe for turning