

Business and Personal.

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Ice Machines. Clayton & Cook, Daretown, N. J. Corliss Engine Builders, with Wetherill's improvements, Engineers, Machinists, Iron Founders, and Boiler Makers. Robt. Wetherill & Co., Chester, Pa.

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Wanted.—A New or Second-hand Brown & Sharp No. 1 Universal Milling Machine. Address, giving full particulars and price, Lidgerwood Manufacturing Co., P. O. Box 2, 132, N. Y.

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The Best Mill in the World, for White Lead, Dry, Paste, or Mixed Paint, Printing Ink, Chocolate, Paris White, Shoe Blacking, etc., Flour, Meal, Feed, Drugs, Cork, etc. Charles Ross, Jr., Williamsburgh, N. J.

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The experiments in testing the efficiency of different Coverings for Steam Pipes at Trinity College Buildings, Hartford, Conn., which resulted in favor of the Chalmers Spence "Air-space" Covering, were conducted under the supervision of F. H. Kimball, the architect of the buildings.

For Sale.—The Patent of a new Water Elevator. Address P. O. Box 470, N. Y. city.

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For Sale, Exchange, or To Let.—Large Factory, with engine complete. Address P. O. Box 470, N. Y. city.

Root Blowers, No. 1, 2, and 4; also a No. 5 Sturtevant Blower—all suitable for cupola or forges—and a No. 6 Hot Blast Heater, in perfect order, at very low prices. Address Hill, Clarke & Co., Boston, Mass.

Bishop Stave-Sawing Machine for light work, Novelty Iron Works, Dubuque, Iowa, sole manufacturers. It makes the best stave, uses less timber, cuts with the grain, and makes 6,000 to 8,000 per day. We also build Barrel Machines for "Slack Work," Gauge Lathes, etc. Send us your address for circulars.

Noise-Quelling Nozzles for Locomotives, Steamboats, etc. T. Shaw, 915 Ridge Ave., Philadelphia, Pa.

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Shaw's Mercury Gauges, U. S. Standard of Pressure, 915 Ridge Ave., Philadelphia, Pa.

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For Town & Village use, Comb'd Hand Fire Engine & Hose Carriage, \$350. Forsaith & Co., Manchester, N. H.

Best and Cheapest Wagon Tire Upsetter, only \$12. Circular free. H. W. Seaman & Co., Millport, N. Y.

John T. Noye & Son, Buffalo, N. Y., are Manufacturers of Burr Mill Stones and Flour Mill Machinery of all kinds, and dealers in Dufour & Co.'s Bolting Cloth. Send for large illustrated catalogue.

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

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, N. Y.

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

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

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

Reliable information given on all subjects relating to Mechanics, Hydraulics, Pneumatics, Steam Engines, and Boilers, by A. F. Nagle, M. E., Providence, R. I.

For the best Gate Valves of all kinds, apply to D. Kennedy & Co., 88 John St., N. Y.

Boulter's Superior Muffles, Assayers and Cupellers Portable Furnaces, Slides, Tile, Fire Brick and Fire Clay for sale. 1809 North St., Philadelphia, Pa.

"Little All Right," the smallest and most perfect Revolver in the world. Rebuilt new both in principle and operation. Send for circular. All Right Firearm's Co., Lawrence, Mass., U. S. A.

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

Felt of every description for Manufacturers' purposes, especially adapted for Polishing, can be furnished in any thickness, size, or shape. Tingue, House & Co., Manufacturers. Salesroom, 69 Duane St., N. Y. Factory at Glenville, Conn.

Improved Wood-working Machinery made by Walker Bros., 73 and 75 Laurel St., Philadelphia, Pa.

Best Pulleys and Couplings made; secured to shafts without keys, set-screws, bolts, or pins. Send for catalogue. Taper Sleeve Pulley Works, Erie, Pa.

Articles in Light Metal Work, Fine Castings in Brass Malleable Iron, &c., Japanning, Tinning, Galvanizing. Welles' Specialty Works, Chicago, Ill.

Gun and Sewing Machine Tools. Pratt & Whitney, Hartford, Conn.

The Varnishes and Japans of Hyatt & Co., established 1872 ("The London Manuf. Co."), made from scientific formula by a practical maker of materials, free of deleterious substances, are, in the success met with, noted for color, purity, and durability, with cheapness, giving them meritorious pre-eminence. Try them. Send for circulars and price list to Company's office, 246 Grand street, N. Y.

C. C. Phillips, 4048 Girard Ave., West Phila., manufactures Vertical and other Burr Mills adapted to all kinds of grinding; also Portable Flouring Mills.

Wind Engines, for general use, where economy and regular power is required. Estimates given and printed instructions furnished. Territory granted. Apply to S. W. Kennedy, 516 Fairmount Ave., Philadelphia, Pa.

Silver Solder and small Tubing. John Holland, Cincinnati, Manufacturer of Gold Pens and Pencil Cases.

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

Patent Scroll and Band Saws. Best and cheapest in use. Cordesman, Egan & Co., Cincinnati, O.

For Boul's Paneling, Moulding, and Dovetailing Machine, and other wood-working machinery, address B. C. Machinery Co., Battle Creek, Mich.

Chester Steel Castings Co. make castings for heavy gearing, and Hydraulic Cylinders where great strength is required. See their advertisement, page 382.

Notes & Queries

(1) H. S. asks: What is the cause of a person sweating after death? There was a case of that kind in our settlement and it was thought very strange. A. Probably it was caused by the condensation of vapor on the cold surface of the body, similar to the action in the case of a pitcher filled with ice water.

(2) R. C. A. asks why the drive wheels of a locomotive grip the rails when the cranks are down, and slip when up? A. It is due to the action of the counterbalance.

(3) W. W. W. asks for a recipe for cleaning kid gloves? A. Wash them in benzine.

(4) B. T. M. says: I had a large brick house on my hands, although not an old one. The foundation having given out, I determined to take it down and build a smaller one, using the same bricks. The brick works is now done, but the old mortar shows very much on the brick, more especially on the headers. Is there any way of cleaning off the old mortar with acid, and what acid, what proportion, and how done? A. It would be very difficult to clean the old lime off so as to look well. It would be better to clean the house a light cream color. However, if you can touch the red spots with a little red paint of the color of the brick, you could then give the house a coat of linseed oil.

(5) W. G. R. says: In painting on china with oil colors I find that the paint will not stick, or rubs off. Can you give a recipe to prepare the object so as to make the painting adhere without burning? A. You might scratch the glaze with fine emery paper and use thick colors; but there is no way of permanently applying colors to china except by burning them in.

(6) W. R. K. says: I am desirous of becoming a surveyor, can you tell me where I can learn? A. It is a very common plan for one who desires to obtain practice in surveying to join a surveying party in some humble capacity, and work his way up. There are also technical schools in which surveying is taught. The profession, like most others, has some vacant seats in the front row.

(7) I. G. R. says: I have a mill and well which stand 160 yards from the bed of the creek; from the bed of the creek to the top of the well is 30 feet. The well is 38 feet deep, 8 feet below the bed of the creek. Can I draw the water from the creek into the well by a siphon? A. Yes.

(8) S. A. H. can free his pot plants from lice by enclosing them in a tight chamber and fumigating them with tobacco smoke.

(9) E. R., in answer to R. P. N., says that the Indian summer is caused by the heat which is absorbed by the Lakes, which is given off during the fall as the atmosphere grows colder.

In answer to W. A. P., who inquires what angle the under side of the teeth of an upright saw should make with a horizontal line, E. R. suggests to make the angle 2°, and to hang the saw forward for cutting soft wood.

(10) I. J. I. asks: What are the different kinds of trout and do they belong to the same species? What is the difference between the salmon and the salmon trout? A. All trout are but a species of the salmon family, inhabiting principally fresh water. The

salmon trout belong to the genus *Salmo*, having one row of teeth on the vomer, true salmon having a smooth palate. It is very much larger than the true trout, of a different color, and is found in larger lakes and rivers. Its habits resemble those of the salmon. There are several species of salmon trout in the lakes of Maine. The brook trout is the *Salmo fontinalis*, and inhabits streams. To the genus *Salmo* also belong the char of the British and Swiss lakes, the gray trout or togue, and the siskiwit of our own great lakes.

(11) T. G. B. asks: Is there such an instrument as an oblong square? A. No.

Does not the wheat crop of California exceed that of Michigan? A. Yes.

Which are the most valuable, the copper mines of Michigan or the gold mines of California? A. The gold mines.

(12) H. W. W. asks how to prepare electroplates from engravings on lead? Have obtained an impression with plaster of Paris, but cannot copper plate it. A. Take your impression in beeswax and dust it lightly over with finely powdered plumbago. There should then be no difficulty in obtaining a copper deposit in a suitable bath.

(13) E. T. H. asks for a recipe for polishing show cases of German silver? A. A good polishing powder consists of rock alum, burned and finely powdered, 5 parts; levigated chalk, 1 part. Mix. Apply with a dry brush.

(14) H. F. B. asks: How to mix paints? A. Buy your paints ready mixed in sealed cans in colors to suit your taste.

What is the best and shortest way of building a continued stairway? A. To learn how to build a stairway with continuous rail, you require a treatise on stairbuilding. If, however, you send the dimensions set apart for your stairs to a stairbuilder in this city, he can furnish the stairs for you, and send a man to put them up. Consult a New York business directory if you do not find what you want in our advertising columns.

(15) R. W. asks for a method of rendering canvas or cotton goods impervious to water, yet pliable? A. Plunge the fabric in a solution containing 20 per cent soap, and afterward into another solution containing the same percentage of sulphate of copper. Wash afterwards.

(16) H. R. H. asks: What is the correct answer to the following example? $714 - 714 + (34 - 034 \times 25 \text{ of } 6)$ The above said example was given at an examination at the Oshkosh State Normal School, and a dispute arose as to how it should be solved. The following are the solutions of the disputants:

First. $714 - 714 = 713 - 286$
 $34 - 034 = 306$
 $25 \text{ of } 6 = 15$
 $306 \times 15 = 459$
 $713 - 286 + 459 = 1554$; answer.
 Second. $25 \text{ of } 6 = 15$
 $034 \times 15 = 051$
 $34 - 051 = 289$
 $714 + 289 = 247058 +$
 $714 - 247058 = -71153942$; answer.

Should the signs of multiplication and division have preference to those of addition and subtraction? A. The second solution is the correct one. For the first solution the example should be given thus: $(714 - 0714) + [(034 - 0034) \times 25 \text{ of } 6]$

(17) H. S. asks how to make a powder or solution whereby he can silverplate without a battery? A. Mix 1 part of chloride of silver with 3 parts of pearlsh, 1 1/2 parts common salt, and 1 part whiting. Rub the mixture on the metal, previously well cleaned by means of a piece of soft leather. When properly silvered the metal should be washed in hot water slightly alkaline.

(18) C. S. F. says: The indicator on my steam gauge before using was down to the pin (zero). After a few days' use it rests at 10 with the boiler empty. Can I safely consider it as indicating 10 lbs. too much under all pressures? It is in working order. A. You cannot, in the absence of a test.

(19) A. A. W. asks whether any better results would be obtained in setting the valves of a locomotive for fast passenger trains, by giving the backing eccentric more lead than the go-ahead one? A. Other things being equal, we think not.

(20) A. A. asks: What is the strength of a band of wrought iron 2 inches in width and 1/4 about (or No. 10, I think) in thickness? A. It should be able to bear a strain of from 10,000 to 12,000 lbs., if the ends are properly welded; a little more than 1/4 as much if they are secured by rivets.

(21) J. W. P. asks: Does not the compression of exhaust steam in the cylinder retard the motion of the engine, and is it a disadvantage only in taking up the lost motion? I find my engine runs smoother with compression, but I do not know about its economy of fuel. A. It is economical to cushion to a certain extent. Compression beyond the economic point is frequently required, in order to make the engine work well.

(22) I. T. S. asks whether a reciprocating engine can be so balanced at a given speed as to stand steady? A. A horizontal engine can be so balanced that there is no tendency to move in a horizontal direction, and if it is sufficiently heavy, it will also be steady in a vertical direction.

(23) S. B. asks: 1. Has an artificial rainbow ever been produced? A. Yes; by projecting a beam of white light through water in the form of very fine spray. 2. Can it be produced, and how? A. See the SCIENTIFIC AMERICAN SUPPLEMENT No. 52, and SCIENCE RECORD for 1874 and 1875.

1. How can I construct the simplest machine (to work by water power) to produce the electric light? A. Sixty to one hundred carbon or Grove cells are connected in series—the zinc of the first and the carbon of the next, and so on. A wire from either end of the series to the lamp completes the circuit.

(24) W. M. says: I have got Bessemer steel shoes ready made for my horse, but the blacksmith cannot weld on caulks of common steel of the Bessemer shoes. A. There should be no difficulty in the

welding if the parts are cleaned on leaving the fire with a steel wire brush; try borax as a flux.

(25) G. C. says: 1. Please inform me if I will get more pressure of water by having my tank bottom made like a funnel, and have a pipe from bottom to my feed pump, than to have it flat? A. No. 2. Also do I want more space for exhaust to escape from heater with two engines than from one, using same steam on both, as one? A. No. 3. Also if one engine has more stroke than the other, will it work all right, both on same shaft, crank on each end, one 8 x 17 and one 10 x 15? A. It can be made to do so. 4. Can I run two engines with as much economy, providing one would do the work? A. Generally, no. 5. I have two rigged up, one 8 x 17 and one 10 x 15; which should I run if only one? I use two boilers, locomotive built. A. It makes very little difference, if they are equally well designed and built. 6. Please say how fast I should run both, and how fast one if used alone? A. You can run them at a piston speed of between 400 and 500 feet per minute, if they are properly constructed.

(26) 'I. E. M. says: A friend has a horse-chestnut tree in front of his house, a limb of which points toward the west. In the winter, when the weather gets down to zero, the limb turns about 7 inches toward the south; when it becomes warm again it resumes its former position. Will you please give me some explanation? A. The phenomenon may be due to unequal contraction in the trunk of the tree or ground.

(27) E. F. says: I have a small seed microscope with 2 lenses, 1 1/2 inch in diameter and 2 1/4 inch focus. Can I make a camera obscura with them? A. No.

How thick is a bound volume of the SCIENTIFIC AMERICAN? A. 1 1/4 inches including covers.

(28) D. F. asks: How is gaseous ammonia made? A. Place a quantity of ammonia water in a retort and apply heat. The gas will immediately begin to come over; it is nearly all expelled from the water by boiling for a few minutes. Ammonia is also obtained by heating ammonium carbonate or chloride (sal ammoniac) with a solution of caustic potash. 2. How can I make gaseous chloride? A. If you mean chlorine, heat an ounce of peroxide of manganese with an equal weight of hydrochloric acid. Chlorine is very poisonous when inhaled. 3. How can I distil chloroform? A. Place the chloroform in a glass retort gently heated. The vapor must be passed through a glass worm surrounded by water, which condenses it.

(29) E. S. asks how to tin cast iron pipe? A. File bright the piece of iron required to be tinned, and mix up the following solution: In a small quantity of spirits of salt, put a piece of zinc the size of a quarter dollar; the spirits of salt will eat it away; wet the places required to be tinned with the solution, then while wet use a copper bit with fine solder, and it will immediately tin.

(30) N. B. asks for a good freezing mixture? A. Pounded ice, salt, and a little sal ammoniac, or ice and hydrochloric acid.

(31) A. J. wishes to polish mother of pearl? A. Go over it with pumicestone finely powdered, and make it very smooth; then apply putty powder and water by a rubber, which will produce a fine gloss and good color.

(32) B. F. asks for a cheap invisible black ink? A. Dissolve 1 fluid oz. of common oil of vitriol in a pint of soft water. Stir well and allow to cool. Write with a clean pen. When dry it will be invisible; held to the fire it turns an indelible black.

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

L. H.—It is quartz—of little value.—J. H. M.—A is a sandstone containing scales of mica. B is a limestone with small particles of marcasite. An analysis would be necessary to determine the exact composition of the samples.—C. M. H.—It is an alloy of tin and lead; the amounts of each can only be determined by a chemical analysis.—E. B.—No. 1 is hornblende. No. 2 is hausmannite—an ore of manganese.—J. S. H.—The rock contains much graphite, and can probably be economically worked.—E. J. F.—It is a ferruginous sand. It does not contain precious metals.—H. F. L.—It is partially altered fibrous talc—a hydrous silicate of magnesia. The mineral is extensively used in the manufacture of writing paper and fireproof roofing paper and paints. It is the chief constituent of many anti-friction powders. See p. 309, current volume of the SCIENTIFIC AMERICAN.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure, the receipt of original papers and contributions upon the following subjects:
 On a Method of Ventilating Rooms. By H. E. V.

HINTS TO CORRESPONDENTS.

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 fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

WANTS AND BUSINESS INQUIRIES.

Almost any desired information, and that of a business nature especially, can be expeditiously obtained by advertising in the column of "Business and Personal," which is set apart for that purpose subject to the charge mentioned at its head.

We have received this week the following inquiries, particulars, etc., regarding which can probably be elicited