

## 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.

OFFICE OF SCOTT & HALL,  
Burlington, Kansas, March 10, 1881.

We, the undersigned citizens of Burlington, hereby certify that the H. W. Johns Asbestos Roofing, put on our new stores last summer by S. H. Davis, of this place, is perfectly wind and water-tight, as well as fireproof. This was proven on Sunday, the 27th of February last, when the stores adjoining burned, and the flames being blown by a strong wind directly upon the buildings, had no effect upon the asbestos, even when the woodwork inside the front cornice caught fire and communicated to the sheathing and rafters, which burnt out from under the roofing, so that the roofing had to be cut away to put out the fire underneath. If it had not been for the asbestos our buildings would probably have burned, as well as most of the business part of the town.

D. E. SCOTT, J. M. ALLISON, W. W. VOENARD.

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

Coal Oil Vapor Torch. Powerful light for foundries and shops. T. R. Loomis, 32 Marion St., Cleveland, O.

To the Iron Trade.—Patent Sectional Furnace. Convenient, rapid. Products equal to best Swedish iron. Inquire of A. W. Almqvist, 37 Park Row, N. Y.

For Sale immediately.—Fraunhofer Equatorial Stand, with graduated circles and verniers driven by clock. Price \$160. Address Carl Becker, 1193 Broadway, N. Y.

Telegraphic, Electrical, and Telephone Supplies, Telegraph Instruments, Electric Bells, Batteries, Magnets, Wires, Carbons, Zincs, and Electrical Materials of every description. Illustrated catalogue and price list, 72 pages, free to any address. J. H. Bunnell & Co., 112 Liberty St., N. Y.

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

Wanted—A Competent Engineer. One who can take indicator cards, and understands economizing fuel. Address, with references and price, R. F. Learned, Natchez, Miss.

For Sale—A complete set of Patterns, Flasks, and Core Arbors, for making Cast Iron Flanged Pipe, Elbows, Tees, and Greenhouse Fittings. Will be sold low to clean out a branch of a business. Address C., Box 1358, New York.

Abbe Bolt Forging Machines and Palmer Power Hammers a specialty. S. C. Forsaith & Co., Manchester, N. H. Foot Lathes, Fret Saws, &c. 90pp. E. Brown, Lowell, Mass.

"How to Keep Boilers Clean," and other valuable information for steam users and engineers. Book of sixty-four pages, published by Jas. F. Hotchkiss, 84 John St., New York, mailed free to any address.

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.

Ball's Variable Cut-off Engine. See adv., page 332.

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

Punching Presses & Shears for Metal-workers, Power Drill Presses, \$25 upward. Power & Foot Lathes. Low Prices. Peerless Punch & Shear Co., 115 S. Liberty St., N. Y. Rollstone Mac, Co.'s Wood Working Mach'y adv. p. 301.

Pure Oak Leather Belting. C. W. Army & Son, Manufacturers, Philadelphia. Correspondence solicited. Paragon School Desk Extension Slides. See adv. p. 334.

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

The Sweetland Chuck. See illus. adv., p. 300.

Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro. 234 Broadway, New York.

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

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 10 Cortlandt St., N. Y.

Presses & Dies. Ferracite Mach. Co., Bridgeton, N. J.

Corrugated Wrought Iron for Tires on Tractor Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsburg, Pa.

Best Oak Tanned Leather Belting. Wm. F. Forpaugh, Jr. & Bros., 531 Jefferson St., Philadelphia, Pa.

4 to 40 H. P. Steam Engines. See adv. p. 318.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch, Phila. Draughtsman's Sensitive Paper. T. H. McCollin, Phila., Pa.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J. Skinner's Chuck. Universal, and Eccentric. See p. 300

For Machinists' Tools, see Whitcomb's adv., p. 300.

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.

Ajax Metals for Locomotive Boxes, Journal Bearings, etc. Sold in ingots or castings. See adv., p. 300. Peck's Patent Drop Press. See adv., page 333.

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

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

The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.

Brass & Copper in sheets, wire & blanks. See ad. p. 334.

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. Cope & Maxwell Mfg Co's Pump adv., page 334.

New Comb'd Milling and Gear Cutting Machines, large range. C. A. Condé & Co., Makers, Philadelphia, Pa. Wren's Patent Grate Bar. See adv. page 333.

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

Learn Telegraphy. Outfit complete, \$4.50. Catalogue free. J. H. Bunnell & Co., 112 Liberty St., N. Y.

Diamond Planers. J. Dickinson, 64 Nassau St., N. Y. The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Eagle Anvils, 10 cents per pound. Fully warranted. Geiser's Patent Grain Thrasher, Peerless, Portable, and Traction Engine. Geiser Mfg. Co., Waynesboro, Pa.

Saw Mill Machinery. Stearns Mfg. Co. See p. 333. Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 334.

For the manufacture of metallic shells, cups, ferrules, blanks, and any and all kinds of small press and stamped work in copper, brass, zinc, iron, or tin, address C. J. Godfrey & Son, Union City, Conn. The manufacture of small wares, notions, and novelties in the above line, a specialty. See advertisement on page 334.

The I. B. Davis Patent Feed Pump. See adv., p. 334.

Magic Lanterns and Stereopticons of all kinds and prices. Views illustrating every subject for public exhibitions, Sunday schools, colleges, and home entertainment. 116 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., New York.

New Economizer Portable Engine. See illus. adv. p. 334.

Upright Self-feeding Hand Drilling Machine. Excellent construction. Pratt & Whitney Co., Hartford, Conn.

Catechism of the Locomotive, 625 pages, 250 engravings. The most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for a catalogue of railroad books. The Railroad Gazette, 73 Broadway, New York.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 332.

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

Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever.

Supplee Steam Engine. See adv. p. 270.

Don't buy a Steam Pump until you have written Valley Machine Co., Easthampton, Mass.

## 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) B. J. F. asks: How is the "snow-flake" appearance produced on card board? A. Mix with a very concentrated aqueous solution of good clean table salt enough of a warm aqueous solution of dextrine to make a very thin mucilage. Apply this with a wide soft brush to the card board—the thinnest possible coating is all that is required. Sulphate of magnesia, acetate of soda, and stannous sulphate are employed in a similar manner.

(2) F. M. asks: Which has the more power: an engine with a 12 inch cylinder and a 20 inch stroke, or an engine with a 12 inch cylinder and a 24 inch stroke, the pistons traveling the same number of feet per minute, other conditions being the same on both? If they had equal power, does one take more steam to run it than the other? And which is preferable for a saw mill? A. There is little difference: the 24 inch stroke would be a trifle more economical, as there would be less loss from clearances and waste spaces; but the 20 inch stroke might be best for a saw mill, as less shafting would be required to get up the speed of the saw.

(3) G. H. H. asks: How can I make a brilliant scarlet ink? I have made a fair carmine by mixing carmine No. 40, 1 oz.; water, one gallon; and a little strong solution of ammonia, but it is no better than the carmine ink sold by stationers. I want to make a pretty ink for fancy ledger work. Cheapness and simplicity are, of course, desired. A. 1. Brazil wood, 2 oz.; stannous chloride, ½ drachm; gum arabic, 1 drachm. Boil down in 32 oz soft water to 16 oz., and strain. 2. Dissolve crimson aniline (soluble) in a sufficient quantity of soft water. 3. Pure carmine, 12 grains; aqua-ammonia, 3 fluid oz.; dissolve, then add powdered gum, 18 grains. Half a drachm of powdered drop lake may be substituted for the carmine where cheapness is an object.

(4) J. S. says: One of the serious problems before a farmer is that of roofing, and any mode which lessens the cost is most desirable. It has been stated that a flat roof made of jointed boards covered with tar paper, and that smeared thickly with coal tar on which road dust is sifted until no tar will appear through it, and this smearing and dusting continued till a thickness of three-eighths or half an inch is attained, will make a durable and effectual roofing. Will it? Such a roof will cost about half that of other roofs, and if as good as claimed should be made. I have some outhouses to construct, and would like to have your opinion and experience. A. Where the dip of the roof is very slight,

and the tar has been boiled for several hours before using, and the gravel is thoroughly dry when put on, a roofing such as described will last a long time and fulfill the requirements very well. If the tar has not been well boiled—to exclude moisture and light volatile matters—it is apt to soften under a hot summer sun, and crack in very cold weather.

(5) S. M. P., Jr., and W. C. ask: What treatment does petroleum (the crude oil) go through in "refining," and what are the products of the treatment? A. Crude petroleum is an intimate mixture of a large number of hydrocarbon oils, which are usually roughly separated by fractional distillation into about half a dozen commercial products. The apparatus employed in the process usually consists in a large iron still provided with an iron worm condenser or series of wrought iron pipes submerged in water for the purpose of keeping the metal cool. When heat is applied to the still the first products which pass over are *rhagoline* and *chymogene*—light gases at ordinary temperatures, and which require an ice-packed condenser and an air pump for their condensation to the liquid state. These are usually permitted to escape. As the contents of the still is more strongly heated condensable vapors soon begin to pass over and a stream of oil trickles from the end of the condenser or worm into the receiving tank. The first oils have a gravity of about 95° Baume, and as the distillation proceeds they become heavier, 90° B., 85° B., 80° B., and so on. In most refining establishments it is customary to allow the first distillate to run into one tank until the gravity of the product reaches about 60° B. This product is called *crude naphtha*, and is separated by redistillation into gasoline (the lightest), naphtha, and benzine. When the oil distilled reaches a gravity of about 60° B., the stream is diverted into the kerosene tank and continues to run into this until it reaches a gravity of about 38° B. This second fraction is the burning oil or kerosene. The oil of a greater gravity than 38° B. is allowed to flow into the paraffine oil tank. When the distillation is finished the residuum of coke or tar is removed from the still. From the third fraction—paraffine oil—solid paraffine is obtained by cold and pressure; the expressed oil serving for the preparation of lubricants, etc. Special products are sometimes made by modifying the fractioning operation. Kerosene oil forms the heart of the crude oil, of which it comprises about 55 per cent.

(6) E. A. and F. M. ask: What are the best methods of preserving autumn leaves and when should the leaves be gathered? A. It depends somewhat upon the season when the leaves develop their greatest beauty and variety of tints. Sumac and the leaves of similar plants or trees are usually gathered early in October. Maple, alder, oak, linden, etc., are now at their best. To preserve the leaves they should be thoroughly dried as soon as possible after gathering and trimming. A simple method of drying the leaves expeditiously is the following: Spread the leaves and press in a suitable pan with alternate layers of fine sifted dry sand heated as hot as the hand can bear and set aside to cool. When the sand has cooled the leaves may be removed, smoothed under a hot iron, dipped for a moment in clear French spirit varnish, and allowed to dry in the air. Melted paraffine and wax are sometimes preferred to the varnish. The following is another way: Spread several thicknesses of fine wrapping paper on the ironing table; arrange the leaves of the spray, picking off those which do not add to its beauty, and lay it out smooth. Pass a warm flat iron over a cake of wax and then over the leaves—first on one side and then on the other. Then place the sprays between sheets of bibulous paper, and put under pressure between two flat boards, for several weeks, changing the paper several times.

(7) J. McD. asks: 1. At what rate of speed does combustion move through the atoms of nitro-glycerine? A. It has never been ascertained. 2. Does any other substance admit of a more rapid propagation? A. We think not.

(8) F. A. S. asks: Can a common photograph of large dimensions be photo-lithographed and reduced by photo-lithography? A. As we understand you, yes. See Printing by Photography, in SUPPLEMENTS, Nos. 143 and 146.

(9) F. L. W. writes: I want something cheap, efficient, and tasteless, for preserving mince meat. If there is anything of the kind please let me know through your correspondence column. If not, please state the best method, and oblige a reader. A. Salicylic acid has been recommended for this purpose, ten to fifteen grains to the pint.

(10) J. M. S. asks: What is the temperature of steam generated directly from water at a pressure of ninety pounds to square inch? A. The temperature of steam under a pressure of ninety pounds per inch is 324.3° Fah. 2. What increase in pressure is had by superheating steam at 90 to a temperature of 340° Fah.? A. About 20 lb. per inch.

(11) T. P. N. asks: What is the chemical process by which the article known as "paper board" is made? A. See the Technology of the Paper Trade, contained in SUPPLEMENTS, Nos. 109, 110, 116, 117, 118, and 123.

(12) N. S. asks: Would it pay to work a mine of pure mica, if in large sheets, with say \$15 or \$20 freight per ton to San Francisco? A. See article on Mica and its Utilization, page 257, current volume.

(13) H. F. asks: 1. How often is it necessary, and how often has the Atlantic cable been laid? A. None of the Atlantic cables have been relaid or laid a second time. They have been frequently broken, but the ends have been taken up and rejoined. 2. What and where is the greatest depth of water known, and which is the roughest for navigation? A. The greatest depth of soundings taken is 4,655 fathoms. Not taking into account monsoons, typhoons, and other extraordinary storms, the Atlantic Ocean is roughest.

(14) C. H. asks: How is citrate of magnesia made, the same as that prepared by druggists? A. Effervescent citrate of magnesia is prepared as follows: Carbonate of magnesia, 25 parts; citric acid, 75 parts; distilled water, q. s. Mix and reduce to a rather

thick paste, which dry at a temperature not exceeding 86° Fah. Mix 14 parts of the dried mass with sodium bicarbonate, 13 parts; citric acid, 6 parts; white sugar, fine powder, 3 parts. Moisten the mixture with a sufficient quantity of alcohol, and pass it through a tinned iron sieve to form a coarse granular powder. Dry the powder in a moderately warm place, and preserve in well closed bottles.

(15) P. H. G. asks: In making a basswood or cedar canoe is anything besides paint necessary to keep the water from soaking into the wood? A. Paint is all that is required.

(16) E. H. C. asks: 1. Is a knowledge of geometry necessary to a mechanical draughtsman? A. Yes. 2. Can a person become a finished mechanical draughtsman by means of self instruction from lessons in the SCIENTIFIC AMERICAN SUPPLEMENT? A. Yes.

(17) S. L. L. writes: 1. A horse is attached to a rope fifty feet in length, one end of which is made fast to a post. The horse is started, and pulls 500 pounds. Question: How many pounds strain is there upon the rope? A. 500 pounds. 2. Two horses are attached to a rope fifty feet in length, one at each end, and pointed in opposite directions. They are started simultaneously, and each of them pull 500 pounds. Question: How many pounds strain is there upon said rope? A. 500 pounds. 3. Is there any point in the rope where a greater strain occurs than at others? A. No.

(18) W. and P. asks: Can you tell us how to make a dip for regilding brass trimmings on gas chandeliers that have been stained by flies? A. Try the following: Phosphate of soda, 1 oz.; gold chloride, 12 grains; water, ¼ pint. Use at or near a boiling heat. Use a dilute aqueous solution of mercuric nitrate to quicken the parts to be gilded.

(19) W. E. asks (1) how and why people get into the habit of burying their dead with the head to the West? A. Originally, as sun worshipers, men buried their dead facing the rising sun. Afterwards, among Western Christians, the dead were buried facing the East—the Holy Land. 2. Last fall I filled a new oak tank with vinegar; it was then perfectly tight, now it leaks badly. With what can I coat the inside so that it will hold vinegar? A. We know of no desirable coating for vinegar tanks. Better dry out the tank, rebrace it, and swell the wood with water before storing the vinegar.

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

E. W.—It is chiefly composed of lime carbonate containing a little sulphide of iron.—W. H. R.—Argentiferous galena ore—a good ore.

### NEW BOOKS AND PUBLICATIONS.

THE CENTURY—(SCRIBNER'S MONTHLY).—As this is the period for annual subscriptions to literary periodicals it will not be out of place to call attention to the wealth of solid and interesting reading matter furnished in a year's number of the above splendid magazine. After looking over the two handsome volumes for last year it may be said that they comprehend an epitome of the best thought of the time. They are a little library in themselves. Some of the best serial novels, the best short stories and sketches, and the most delightful bits of verse that have appeared in this country during the year, are in these attractive pages. A list of contributors would simply be a list of the best names familiar to students of the literature of the day. Among those who have contributed to the magazine during the past year are: Mrs. Frances Hodgson Burnett, W. D. Howells, George W. Cable, H. H. Boyesen, Eugene Schuyler, Dr. J. G. Holland, John Burroughs, Theodore Thomas, Richard Henry Dana, E. C. Steadman, Ralph Waldo Emerson, Sir Julius Benedict, George E. Waring, Jr., Joel Chandler Harris (Uncle Remus), R. W. Gilmer, and a great multitude of men and women eminent in letters, and gifted with the faculty of ornamenting every subject that they touch. No other magazine designed for the instruction and pleasure of the English speaking people, we are confident, embraces in its scope so vast a variety of topics which come home to the business and the home life of its readers. In art especially, the conductors of the magazine have created a complete revolution. Much has been written, and much more might fairly be said, about the change and the improvement wrought in American art, as illustrated in wood engraving and printing, since the establishment of Scribner's Magazine. The illustrations are simply superb. The freshness of the monthly pages of Scribner's has been a subject for the admiration and pleasure of its readers; and it is a satisfaction to find that they do not become stale by the passage of the months. \$3 a year. Published by the Century Company, Union Square, New York.

THE TEETH OF SPUR WHEELS. By Professor C. W. MacCord, Hartford, Conn.: The Pratt & Whitney Company.

Develops mathematically the principles which should govern the construction of spurgearing, and describes the machines employed by the Pratt & Whitney Company for the accurate formation of cutters for spur wheels.

BROWN BROTHERS & CO.'S CATALOGUE OF SUPPLIES FOR COTTON, WOOLEN, SILK, JUTE, AND FLAX MILLS. Providence, Rhode Island.

This illustrated price list of supplies for textile manufactures contains also a large number of rules and tables useful to spinners.

A CATECHISM OF THE MARINE STEAM ENGINE. By Emory Edwards. Third Edition. Philadelphia: Henry Carey Baird & Co.

To the earlier edition (favorably noticed some months ago) Mr. Edwards has prefixed a chapter on the philosophy and operation of the marine steam engine, and has introduced considerable new matter descriptive of recent types of marine boilers. Curiously no mention is made of the valuable improvements made by Mr. Herreshoff.