

**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. The publishers of this paper guarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.

Wanted—Second-hand Baxter Steam Engine. Address J. W. Reid, South Argyle, N. Y.

3 in. Telescopes, achromatic glasses by Wray, London, \$65; 1 3/4 in. diam. Reflector, \$50; and all other sizes; finest quality. Ramsden & Co., 610 Arch St., Philadelphia, Pa.

Sample Specialties wanted for Export; notions, fancy goods, toys, etc. Address W. B., Box 773, N. Y. city.

We want Velocipede Wheels.—Manufacturers of same will please send us their price lists at once. We think some improved cast hub for these wheels will suit us best. United States Manuf. Company, Chicago, Ill.

Wanted—Parties with Capital to Manufacture on Royalty, or other ways, a Patented Article, suitable for the Carriage Hardware Trade. Address P. O. Box 630, Rumford, R. I.

Asbestos Board, Packing, Gaskets, Fibers, Asbestos Materials for Steam & Building Purposes. Boiler & Pipe Covering, Asbestos Pat. Fiber Co., limited, 194 B'way, N. Y.

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole m'frs., H. Lloyd, Son & Co., Pittsb'g, Pa.

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

Apply to J. H. Blaisdell for all kinds of Wood and Iron Working Machinery. 107 Liberty St., New York. Send for illustrated catalogue.

Lubricene, Gear Grease, Cylinder and Machinery Oils. R. J. Chard, 6 Burling Slip, New York.

Telephones repaired, parts of same for sale. Send stamp for circulars. P. O. Box 235, Jersey City, N. J.

Our new Stylographic Pen (just patented), having the duplex interchangeable point section, is the very latest improvement. The Stylographic Pen Co., Room 13, 169 Broadway, N. Y.

Advertising of all kinds in all American Newspapers. Special lists free. Address E. N. Freshman & Bros., Cincinnati, O.

Skinner & Wood, Erie, Pa., Portable and Stationary Engines, etc. full of orders, and withdraw their illustrated advertisement. Send for their new circulars.

Sweetland & Co., 126 Union St., New Haven, Conn., manufacture the Sweetland Combination Chuck.

Power, Foot, and Hand Presses for Metal Workers. Lowest prices. Peerless Punch & Shear Co., 52 Dey St., N. Y.

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

For the best Stave, Barrel, Keg, and Hoghead Machinery, address H. A. Crossley, Cleveland, Ohio.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr. & Bros. 581 Jefferson St., Philadelphia, Pa.

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 40 John St., N. Y.

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

Stave, Barrel, Keg, and Hoghead Machinery a specialty, by E. & B. Holmes, Buffalo, 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, 87 and 88 Park Row, N. Y.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus, etc. Condit, Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other cantools. Bliss & Williams, B'klyn, N. Y.

Blake "Lion and Eagle" Imp'd Crusher. See p. 13.

Instruction in Steam and Mechanical Engineering. A thorough practical education, and a desirable situation as soon as competent, can be obtained at the National Institute of Steam Engineering, Bridgeport, Conn. For particulars, send for pamphlet.

Hydraulic Jacks, Presses and Pumps. Polishing and Buffing Machinery. Patent Punches, Shears, etc. E. Lyon & Co., 470 Grand St., New York.

Forsyth & Co., Manchester, N. H., & 207 Centre St., N. Y. Bolt Forging Machines, Power Hammers, Comb'd Hand Fire Eng. & Hose Carriages, New & 2d hand Machinery. Send stamp for illus. cat. State just what you want.

Air Compressors, Blowing Engines, Steam Pumping Machinery, Hydraulic Presses. Philadelphia Hydraulic Works, Philadelphia, Pa.

Wright's Patent Steam Engine, with automatic cut off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.

Sheet Metal Presses, Ferracite Co., Bridgeton, N. J.

Peck's Patent Drop Press. See adv., page 14.

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 13.

The best Truss ever used. Send for descriptive circular to N. Y. Elastic Truss Co., 683 Broadway, New York.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 28.

For Separators, Farm & Vertical Engines, see adv. p. 28.

For Patent Shapers and Planers, see illus. adv. p. 28.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 29.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 831.

Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 29.

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

Silent Injector, Blower, and Exhauster. See adv. p. 45.

Horizontal Steam Engines and Boilers of best construction. Atlantic Steam Engine Works, Brooklyn, N. Y.

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. Brass & Copper in sheets, wire & blanks. See ad. p. 45.

For Alcott's Improved Turbine, see adv. p. 45.

Air Compressors. Clayton Stm. Pump W'ks, B'klyn, N. Y.

Machine Diamonds. J. Dickinson, 64 Nassau St., N. Y.

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

For Superior Steam Heat. Appar., see adv., page 45.

Millstone Dressing Machine. See adv., page 45.

Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 413.

Hydraulic Cylinders, Wheels, and Pinions, Machinery Castings; all kinds; strong and durable; and easily worked. Tensile strength not less than 65,000 lbs. to square in. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

New Economizer Portable Engine. See illus. adv. p. 45.

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.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 45. Totten & Co., Pittsburg.

**NEW BOOKS AND PUBLICATIONS.**

**DIGEST OF PATENTS ON CULTIVATORS.**

Some time ago we had occasion to notice a valuable digest on seeding machines and implements, compiled by James T. Allen, of the Patent Office, Washington. Encouraged by the demand for that work, the author proposes to issue in two volumes a digest of all the cultivators and attachments belonging to that kind of machine, which have been patented up to July 1 of the present year. They number over 5,700, and each invention will be illustrated, similar to the engravings in the *Official Gazette*. The full claims of each patent will be given, and when necessary for a better understanding the invention extracts from the specification will also be made. To manufacturers of agricultural implements and for patent solicitors and lawyers this new digest will be found very useful. Mr. Allen, whose address is Lock Box 699, Washington, D. C., would like to hear from persons who wish to subscribe for the work.

**A DIGEST OF PATENT OFFICE DECISIONS, 1869-1879.** By William Edgar Simonds. Washington, D. C.: W. H. & O. H. Morrison.

A digest, in classified and chronological order, of substantially all the reported decisions of the Commissioners of Patents to January, 1880. The cases omitted are mainly those the reading of which, in the authors' opinion, throws no light on any principle of law, mechanics, or practice. The digests appear to have been made with painstaking care and sound judgment, and the volume cannot fail to be handy and serviceable to all having to do with patent law, whether inventors or attorneys.

**ARCHAEOLOGICAL INSTITUTE OF AMERICA.**

**First Annual Report of the Executive Committee, 1879-80.** Cambridge: John Wilson & Son. 8vo, paper, pp. 26.

The Archaeological Institute of America has been formed for the purpose of promoting and directing archaeological investigation and research—by the sending out of expeditions for special investigation, by aiding the efforts of independent explorers, by publication of reports of the results of the expeditions which the Institute may undertake or promote, and by any other means which may from time to time appear desirable. Though but a year old the Institute has secured a large and influential membership, and has undertaken work which proves it worthy of a place in the front rank of American scientific societies. Its first year's contributions include a valuable essay by the Hon. Lewis H. Morgan, on the system of house building practiced by the Indians; Mr. J. T. Clarke's studies of the monuments and ruins along the Greek shores; and Mr. W. J. Stillman's investigations at Monte Leone in Italy. The Institute's work laid out for the present year includes an expedition to Colorado and New Mexico, to investigate the institutions and history of the Pueblo or village Indians of those regions.

**THE CABINET MAKER AND UPHOLSTERER'S COMPANION.** By J. Stokes. Philadelphia: Henry Carey Baird & Co. \$1.25.

This is a fifth edition of Mr. Stokes's work, with valuable additions, covering the treatment, finishing, restoration, and improvement of wood surfaces. The book is well indexed and has a full table of contents.

**SEWAGE DISPOSAL.** By Henry Robinson. London and New York: E. & F. N. Spon. \$1.50.

Reviews briefly the experience of British engineers and sanitarians in the disposal of water-carried sewage, no attention being given to any other methods of dealing with the waste matter of towns. Where suitable land is available Mr. Robinson advises irrigation, otherwise he would employ chemical treatment; but he does not encourage any extravagant expectations of profit from either method.

**LETTS' POPULAR ATLAS. IN MONTHLY PARTS.** London: Letts, Son & Co.

The first part of this promising series contains a double sheet showing the world on Mercator's projection, and a map of the British Isles. The maps are carefully drawn, clearly engraved, and well printed; size 17 inches by 14 inches. The price, seven pence a part of three maps, is very low for work so well executed. Ocean depths are shown by graded shades of blue; ocean currents by distinctive white and blue lines; ocean cables and main lines of land telegraph, by red lines. The plan includes special geological and railway maps. The first year's issue will cover the principal divisions of the globe; and subsequent parts will supply maps more in detail until the atlas is made complete. On special maps, roads, lighthouses, and other useful details will be given.

**THE METRIC SYSTEM AND INTERCHANGE OF WEIGHTS AND MEASURES.** By D. Beach, Jr., and E. A. Gibbens. New York: G. P. Putnam's Sons. 75 cents.

Apparently designed for a school book, to familiarize boys and girls with the names and comparative values of metric standards. The book is neatly made and seems likely to be useful.

**THE AMERICAN BICYCLE.** By Charles E. Pratt. Boston: Issued by the Pope Mfg Company, 87 Sumner street.

A second edition of Mr. Pratt's manual for "the Observer, the Learner, and the Expert" in the use of the "wheel," to which the author has added an appendix for 1880. The new matter reviews the recent progress of bicycling at home and abroad, improvements in the manufacture of the wheel, recent races, the rules of American bicycle clubs, and offers forty-five new excursion routes, with stations and distances.

**MEMOIRS OF THE SCIENCE DEPARTMENT, UNIVERSITY OF TOKIO, JAPAN, VOL. II. On Mining and Mines in Japan.** By C. Netto, M.E., Professor of Mining and Metallurgy. Tokio, Japan: Published by the University.

In the order of their importance the minerals of Japan are coal, copper, silver, gold, iron, kaolin, petroleum, sulphur, lead, antimony, tin, cobalt, quicksilver, marble, jasper, agate, amber, graphite. The yield in 1877 was nearly eight million cwt. of coal; 75,423 cwt. of copper; 96,213 cwt. pig iron; 354,392 oz. silver, and 11,231 oz. gold. The production of antimony is increasing. The yield of lead, tin, copper, quicksilver and petroleum, is not sufficient for home consumption.

**THE MOULDER'S AND FOUNDER'S POCKET GUIDE.** By Fred. Overman, M.E., with supplement by A. A. Fesquet. Illustrated. Philadelphia: Henry Carey Baird & Co. 12mo, cloth, pp. 342. 1880.

A new edition of the late Frederick Overman's successful treatise on moulding and founding, the construction of melting furnaces, the composition of alloys, etc., to which Mr. Fesquet has added nearly a hundred pages on statuary and ornamental moulding, ordnance, malleable iron castings, and other matters of importance to moulders and founders; also a careful index giving eight or nine hundred references.

**CATALOGUE OF BOOKS AND PAPERS RELATING TO ELECTRICITY, MAGNETISM, THE ELECTRIC TELEGRAPH, ETC., INCLUDING THE RONALDS LIBRARY.** Compiled by Sir Francis Ronalds, F.R.S., and edited by Alfred J. Frost. London and New York: E. & F. N. Spon. 1880. 8vo, paper, pp. 564.

As early as 1816 Sir Francis Ronalds demonstrated by actual experiment the possibility of an electric telegraph, and showed that frictional electricity could be practically used for conveying messages over long distances. It was his misfortune, however, that in this particular his views and experimental demonstrations were a quarter of a century in advance of those of his scientific and official countrymen. After thoroughly proving the practicability of his scheme he submitted his plan to the First Lord of the British Admiralty, Lord Melville. After some delay he received from Mr. Barrow (afterwards Sir John Barrow) Secretary of the Admiralty, a curt note informing him "that telegraphs of any kind are now wholly unnecessary; and that no other than the one now in use will be adopted." This note was dated August 5, 1816, at which time the government was supporting a semaphore telegraph between London and Portsmouth, costing \$10,000 a year, and usable only five or six hours a day in clear weather. For many years Sir Francis Ronalds devoted much time and money to the collection of a library of works relating to electricity, magnetism, and the telegraph, and the compilation of a catalogue of all such publications. After his death the collection was presented to the English Society of Telegraphic Engineers, and the catalogue, containing over 13,000 entries, has now been printed by the society. Its value to all specialists in this department of science goes without saying.

**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.

(1) F. J. B. writes: I am an architectural designer, and finish all my drawings, shaded elevations, etc., only in pencil. The penciling, however, rubs off too easy and dirties and spoils the drawing very badly. I should feel pleased to know of some liquid to pour over it and thus prevent the rubbing off of the penciling without spoiling the drawings, which are stretched on drawing board. A very thin aqueous solution of gum arabic is sometimes serviceable. Thin collodion (plain) does very well; or white of egg dissolved in dilute ammonia water by agitation with broken glass.

(2) J. B. G. writes: I would like to know what is the best material to use for gluing two pieces of wood together that will stand boiling water without injury. A. Try a solution of gum caoutchouc in bisulphide of carbon. Before using add to it about one per cent of chloride of sulphur (dry). The solution should have about the consistence of molasses. Give the cement plenty of time to harden in the joint.

(3) W. H. D. asks: What can I clean copper coins with and keep them bright? A. Remove grease by dipping in strong hot potash lye, then clean with cyanide of potassium solution (aqueous); or dip bright in nitric acid and rinse immediately in running water. To keep them bright, oil them, or coat with a thin pale alcoholic solution of pale shellac.

(4) C. A. H. asks what the dry paper is, or what it is saturated with, which gas men use for testing the gas for sulph-hydrogen, or impurities. A. Saturate unsized paper with a strong aqueous solution of acetate of lead, and dry. When moistened and exposed to gas containing sulphureted hydrogen it is blackened.

(5) C. W. A. says: My house is connected with water main by 800 feet of 1, 1 1/4, and 1 1/2 inch iron pipe. The main is of wood wound with strap iron, and extends through the streets of the town. Now, I am going to put up lightning rods, and I want to know if it will give sufficient ground if I connect with the water pipe? What kind of rod, points, and fastening will be best? Please give me the method of destroying stumps by means of crude petroleum. A. The 800 feet of iron pipe will make a fair ground connection. Use several separate rods composed of one-quarter inch copper wire, one to each chimney and to each gable point. Attach the rod directly to house by staples; no insulators. Let each rod be in one piece; but if jointed see that the joints are well soldered. Carefully solder the terminals of the rods to the water pipe. Point the rods with a file. The important thing is to have several rods—the more the better—each rod thoroughly connected with the ground conductor, which in your case is the iron water pipe. As to stumps, bore deep with an auger, fill the hole with petroleum; repeat till the wood is well saturated with oil; then set fire.

(6) W. R. S. writes: Please inform me of some simple and efficient way to detect the presence of electricity passing from one body to another. A. For merely detecting a slight current there is nothing simpler than a bell telephone. If a current passes it will be readily detected when the connections are broken or established. If you desire to measure the current a galvanometer will be required.

(7) J. S. C. asks: 1. How can I make a good cheap foot walk? Would a walk made of lime and gravel last any length of time? If so, how is the right way to mix and lay it? A. See concrete floors and concrete walks in SUPPLEMENTS, Nos. 23 and 36. 2. Is a battery used with the telephone described in SUPPLEMENT, No. 142? A. No, unless a transmitter is used. 3. Can a battery be made of copper and zinc immersed in blue vitriol and water that will be strong enough to plate and electrotype with? A. Yes. See batteries in SUPPLEMENTS, No. 157, 158, 159.

(8) E. M. asks: Please tell how to test a steam boiler correctly. How many pounds water pressure will it need to safely carry 70 lb. steam pressure? A. Use a forcing pump. The government rule requires the test to be 50 per cent greater than the pressure of steam to be carried. For 70 lb. steam test, pressure 105 lb.

(9) F. F. asks: Please inform me in your next paper which of the different shafts in a factory is called the main shaft? A. The shaft, which first receives the power from the engine or water wheel, and from which the power is distributed to the various other shafts of the factory.

(10) T. D. writes: I have just completed a catamaran or double hulled sail boat, the plans for which I took from your SUPPLEMENT, No. 105. It has proved a great success, being very speedy and safe, and has in smooth water attained the speed of over 17 miles an hour.

(11) J. G. X. writes: In making a taper tap of say one sixteenth inch taper to the inch, I claim that after turning the taper you let the poppet head stand in the same position, and placing your thread gauge against the tap, set the lathe tool by the taper. The other party claims that after the tap is turned taper, you push back the poppet head to its true center, then set the tool with your thread gauge, bring the poppet to the taper again, and cut the thread. This I claim will not bring the thread square with the tap. Which is right? A. You are wrong. The pitch of the thread is taken on the center of the tap and not of the surface.

(12) L. W. asks: 1. What kind of a motor would be the best to run a fan 12 inches long, 8 inches through, shaft pulley 1 inch, with about 200 to 300 revolutions per minute, running for about 6 hours without attendance? A. A caloric engine, if you have neither steam nor water power.

(13) E. H. asks for a formula for making that paste or sticky substance for catching birds, something which will work as well in winter as in summer. I think it is called birdlime; if not, what is bird lime? A. Boil the middle bark of the holly, gathered in June or July, for six or eight hours in water, until it becomes tender; then drain off the water and place it in a pot under ground, in layers with fern, and surround it with stones. Leave it to ferment for two or three weeks, until it forms a sort of mucilage. This is pounded in a mortar into a mass and well rubbed between the hands in running water until all the refuse is worked out; then place it in an earthen vessel and leave it for four or five days to ferment and purify. This is an old fashioned receipt. Birdlime is also made from mistletoe berries and the bark of the wafering tree.

(14) F. C. S. writes: I have an old house which has not been painted in twenty years. Can you tell me of a sizing or something to put on before I paint with lead and oil, to fill up with and which will not scale? A. Sizing is not used. In painting old work the painter first cleans it with the brush and knife, stopping out the