

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.

For one dollar, will send receipt for making the best Non-conducting Boiler Covering in use. Costs 75 cents per barrel; warranted to save one-third the fuel. S. T. Holmes, Grand Rapids, Mich.

H. A. Lee's Moulding Machines, Worcester, Mass. Carbon Plates. P. Bowe, 48 R. R. Ave., Jersey City, N. J. Draughtsmen, Lithographers, Engineers, and Manufacturers, send postal to H. D. Mentzel & Co., Baltimore, for circular of Howard's Autographic Transfer Ink.

Wanted—Particulars and Prices of Wire Rope and Winding Gear, Lowering Brakes for Inclines, and Mining Plant generally. Young Bros., C. E., Westport, New Zealand.

For Sale at a Bargain.—The "Wyandot Chief" Foundry and Machine Works, of Upper Sandusky, Ohio, fully equipped with patterns and machinery for the manufacture of portable and stationary steam engines, circular sawmills, etc., etc., will be sold cheap and on easy terms. For particulars, call on or address me as above. Geo. B. Stevenson.

For Sale, the most complete file of SCIENTIFIC AMERICAN in existence, from vol. 1 to date. A. S. Fowle, 68 Orchard St., Newark, N. J.

Old established Pattern and Model Shop for sale; rear 241 Arch St., Philadelphia, Pa.

Wiley & Russell Mfg Co. See adv., p. 108.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 140.

New styles in Steel Pens are being brought out every year by the Esterbrook Steel Pen Company. Factory in Camden, N. J.

2d-hand Machinists' Tools, Lathes, Planers, and Drills, for sale. Address Hawes Machine Co., Fall River, Mass.

Carbutt's Gelatino-Bromide Dry Plates for Artists, Architects, Amateur and Professional Photographers. Send for circular. Jno. Carbutt, Mfr., 9th and Arch Sts., Philadelphia, Pa.

Recipes and Information on all Industrial Processes. Park Benjamin's Expert Office, 50 Astor House, N. Y.

Dish Washing Machine wanted; one that is capable of washing 25,000 daily. A liberal offer will be made any party possessing such a machine, by addressing D.W.M., Box 773, New York city.

Books relating to Civil Engineering, Electricity, Electric Light, Gas, Heat, Hydraulics, Mining, Sanitary Engineering, Steam Engine, Turning, etc. Catalogues free. E. & F. N. Spon, 446 Broome St., New York.

Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro., 50 Astor House, New York.

For Yale Mills and Engines, see page 109.

Rules for Engineers and Firemen, and the Removal of Scale in Boilers. Send for circular. Rankin & Co., 50 Federal St., Boston.

For Best Quality Brass and Composition Castings, address E. Stebbins Mfg. Co., Brightwood, Mass.

Telephones repaired, parts of same for sale. Send stamp for circulars. P. O. Box 205, Jersey City, N. J.

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

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

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

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, are 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., 531 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.

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 can tools. Bliss & Williams, B'klyn, N. Y.

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

Sheet Metal Presses, Ferracute Co., Bridgeton, N. J. Wright's Patent Steam Engine, with automatic cut off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 93. Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 93.

For Alcott's Improved Turbine, see adv. p. 110. Burgess' Non-conductor for Heated Surfaces; easily applied, efficient, and inexpensive. Applicable to plain or curved surfaces, pipes, elbows, and valves. See p. 284.

Eclipse Portable Engine. See illustrated adv., p. 125.

For best low price Planer and Match, and latest improved Sash, Door, and Blind Machinery, send for catalogue to Rowley & Hermance, Williamsport, Pa.

4 to 40 H. P. Steam Engines. See adv. p. 125.

Silent Injector, Blower, and Exhauster. See adv. p. 141.

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

Peck's Patent Drop Press. See adv., page 140.

Blake "Lion and Eagle" Imp'd Crusher. See p. 141.

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. 141.

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

All Dealers sell the New \$4 Drill Chuck; holds from 0 to 9-16. A. F. Cushman, Hartford, Conn.

Millstone Dressing Diamonds. Simple, effective, and durable. J. Dickinson, 64 Nassau St., New York.

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

For Superior Steam Heat. Appar., see adv., page 141.

Eagle Anvils, 10 cents per pound. Fully warranted.

Valve Re-fitting Machine. See adv., page 141.

Gear Wheels for Models (list free); experimental and model work, dies and punches, metal cutting, manufacturing, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa.

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 142.

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

Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 141.

Telephones.—Inventors of Improvements in Telephones and Telephonic Apparatus are requested to communicate with the Scottish Telephonic Exchange, Limited, 34 St. Andrew Square, Edinburgh, Scotland. J. G. Lorrain, General Manager.

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. 141.

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.

Saw Mill Machinery. Stearns Mfg. Co. See p. 141.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 141. Totten & Co., Pittsburg.

NEW BOOKS AND PUBLICATIONS.

A SELECTION OF SPIRITUAL SONGS WITH MUSIC, FOR THE SUNDAY-SCHOOL. Rev. Charles S. Robinson, D.D. New York: Scribner & Co. Price 50 cents.

An exceptionally judicious collection of Sunday-school hymns, Dr. Robinson's pure taste leading to a rigorous exclusion of the rant and doggerel unhappily so popular in many Sunday-schools.

MICROSCOPIST'S ANNUAL FOR 1879. New York: The Industrial Publication Company. Limp cloth, pp. 48. Price 25 cents.

Contains tables, rules, formulas, and memoranda of use to microscopists. Also a list of American and European microscopical societies, with officers; a directory of prominent makers, dealers, and importers of microscopes; postal information for microscopists, etc.

DIE RADREIFEN-BEFESTIGUNGEN BEI EISENBahnWAGEN-RAEDERN. EINE SAMMLUNG PATENTERTES CONSTRUCTION. Von C. Kessler, Civil Ingenieur. Berlin: 1880. Polytechnische Buchhandlung (A. Seydel). (Tire Attachments for Railroad Wheels.) 63 p.

This work consists of a digest of the English and German patents granted for improvements in attaching tires to railroad car wheels. Three hundred and twenty-one illustrations of patents are shown, arranged according to date and provided with a brief description or note. This publication will be of great value for the railroad engineer, car builder, and machinist.



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) A. S. asks: What is the office of a check valve? A. It performs two offices: 1. It relieves the pump valves from the pressure. 2. It permits of opening the pump for examination without blowing off steam, and it retains the water in the boiler in case of the bursting of the feed pipe.

(2) S. R. asks how to letter with gold and silver leaf on glass. A. The size is prepared by dissolving one ounce isinglass in just enough water to cover it; when dissolved add a pint of rectified wine spirit and make up to a quart with water. Give the clean glass a flowing coat of this, and carefully lay on the leaf which will then readily adhere to the glass. Let it remain twenty-four hours to dry. The designor letter is drawn on paper, and the lines pricked with needle holes. Place this against the gilded surface and dust it thoroughly with powdered whiting. When the paper is removed there will remain a correct copy of the design or letter on the gold. Now fill up the outline with oil gold size in which has been ground some orange chrome, thinned somewhat with boiled oil and turpentine. When this has thoroughly dried wash off the surplus gold with water, applied with a tuft of cotton.

(3) B. S. T. asks: 1. For a satisfactory process for waterproofing cloth. A. Saturate the fabric with a strong hot aqueous solution of soap, press out excess, and transfer to a second bath consisting of a strong aqueous solution of sulphate or acetate of alumina or acetate of lead, for several hours. Repeat if necessary, press out excess of liquid, and dry, not too rapidly, in the air. 2. Can you give me a process for determining quantitatively the presence of cinchonidine as an adulterant of quinine? A. Five to ten grammes of the mixed alkaloids are mixed with fifty grammes of ether, and the mixture, after well shaking, left at rest until next day. By this operation the alkaloids are separated into two parts: one soluble in ether, and another insoluble in that liquid. The part soluble in ether contains the quinine, while the insoluble part contains the cinchonidine. These two parts are separated by a filter, the insoluble part washed with some ether, and the ethereal solution evaporated. This insoluble part is now mixed with forty parts of hot water, and converted into neutral sulphate by careful addition of diluted sulphuric acid, so that a solution is obtained having a slight alkaline reaction upon red litmus paper. To this solution a solution of tartrate of potash and soda is added in sufficient quantity to convert the sulphates into tartrates, and after stirring with a glass rod, allowed to remain for twenty-four hours. If cinchonidine be present in appreciable quantity, its tartrate will be found separated in crystalline form. The tartrate of cinchonidine is collected upon a filter, washed with a little water, and dried on a water bath. One part of this tartrate represents 0.804 part of cinchonidine.

(4) A. R. G. asks how to detect small quantities of gold in sulphurets. A. Reduce the whole of a sample of several ounces of the ore, by grinding, to an impalpable powder, that will pass readily through an 80 mesh sieve; mix about a drachm of the well mixed powder with ten times its weight of pure lead and one or two fragments of borax glass the size of peas, place in a scorifier and expose in a closed muffle to bright red heat until the lead is all fused and the ore floats on top; then open the muffle and let a current of air pass slowly over the red hot scorifier and its fused contents until the ore has been absorbed and the fused metal has disappeared beneath a covering of litharge; then remove, cool, break, remove and clean the lead button, and place it carefully in a heated cupel weighing somewhat more than the bead; when the lead has melted the muffle is opened and the air allowed to pass over the fluid mass until the lead has all been converted into litharge, and the litharge absorbed by the cupel, leaving the gold and silver behind; if the bead is white, silver is present; add about twice the weight of the bead of pure silver, fuse together with the blowpipe flame on a charcoal support, flatten while hot on an anvil, and heat for some time to boiling with pure nitric acid, which dissolves the silver, leaving the gold, if any were present in the ore, as a brownish black mass, which shows the characteristic luster when pressed with a knife blade, and when brought into contact with a drop of aqua regia, and then with a crystal of stannous chloride, develops a purplish-red, violet, or brownish-red coloration—purple of Cassius.

(5) W. T. R. asks if a ground connection for a lightning rod will be a good one if soldered or attached to a gas pipe (iron) underground. Will it be attended with any danger to the occupants of house if struck with lightning, pipe full of gas? Will a lead water pipe do for ground connection for lightning rod? A. The rod should be soldered to the gas pipe, and that forms a good ground connection. No danger from the gas. A lead water pipe would do for ground connection if the rod is soldered thereto; but an iron pipe is much better. Lead is a poor conductor of electricity.

(6) D. P. asks for the proportion of chemicals used in the mixture of white or flint lime glass. A. Flint glass is composed of 300 parts of pure white sand, 200 parts of minium, 100 parts refined pearl ash, and 30 parts of niter. Crown glass consists of 22 per cent of potash, 12.5 per cent of lime, and 62 per cent of silicic acid.

(7) L. D. C. asks: 1. Suppose the motive power for an electric light should suddenly stop, would the lights immediately go out? A. Yes. 2. If they would, is there any known means by which the electricity or power could be stored or accumulated, so that the lights would not be impaired? A. No. 3. What I wish to know is, to make plainer, is there any way that electricity, as a motive power, can be stored up, the same as can be done by compressing air or raising water to a height? A. No.

(8) T. W. McN. writes: In the SCIENTIFIC AMERICAN, No. 26, June 26, 1880, page 404, is an article headed "Lunar Caustic for Purifying Spirits." Can you give me the full particulars as to the manner of treatment, or can you tell where to find them? A. According to M. Berliet the silver nitrate is dissolved in 10 parts of soft water, and about one-quarter ounce of the solution is added to each 100 gallons of the spirit before rectification. The silver remains in the still.

(9) M. J. D. asks how to put up green corn and lima beans in glass fruit jars. A. Fill the cans completely, immerse them nearly to the top in boiling water for an hour or more, or until the contents are thoroughly cooked. Seal while hot.

(10) H. S. asks for a composition to make jars that will hold acid, beside clay, glass, or metal. A.

For the stronger acids (nitric, hydrochloric, and sulphuric) the only suitable vessels are of glass, porcelain, stoneware, or enameled iron, excluding the metals, platinum, gold, lead, etc. When the muriatic or sulphuric acids are diluted with water, vessels of wood or papier mache coated with gutta-percha, rubber, or asphaltum, answer very well.

(11) W. H. S. writes: I have been informed that a few years since there was sold in London a prepared paper for making duplicate copies of manuscript by electricity. The mode of using it was to place the paper upon a metallic surface connected with one pole of a battery, while the writing was done with a metallic stylus attached to the other pole of the same battery. The electricity passing through the paper changed the color of the paper at every point the stylus touched. Can you tell me how the paper can be prepared to produce this result? Can it be done with dry paper? A. Saturate the paper (unsized) with a dilute aqueous solution of iodide of potassium, and dry. It should be slightly moist when used.

(12) S. asks how to make dry, black, type-writer ribbons. There are two kinds in the market, one known as "copyable" and one as lithographic. A. Triturate fine lamp black (or ivory black) and warm lard together to form a thin paste and stiffen with a little wax; or triturate fine (soluble) nigrosine with hot glycerine to form a smooth sirup. Fill the ribbons with either, and, with a light pressure, remove any excess.

(13) C. J. H. writes: I inclose an analysis of Massena water, and would be glad to have you state whether the introduction into it of the ordinary carbonic acid gas with which soda water is charged would at all injure the medicinal properties of the water; whether this water could be put into the tin-lined copper fountains and drawn up through, as soda water ordinarily is, without injury to the fountain or fixtures? If so, how the fountain could be afterwards cleansed, to rid it of the sulphurous smell? Would an ordinary whisky barrel be strong enough to charge with enough carbonic acid gas to force the water up to a floor above—say, 12 feet—to be drawn in the way mentioned? How much pressure would it require? A. The water may be charged with carbonic acid without danger of affecting any of its constituents. It is not safe to use a barrel in the manner proposed. Better use a porcelain-lined iron cylinder, if obtainable. Such water should not be drawn through tin pipes.

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

O. P.—The stone probably contains nothing of value—a variety of serpentine.—H. S.—Calcium carbonate—of little value.—B. M. L.—Hornblende rock containing pyrrhotine—a sulphide of iron. The pyrrhotine probably contains a little nickel.—G. R.—Nodular iron pyrites. It probably carries a trace of gold.—J. B.—Yes, it is horn silver—silver chloride.—E. M.—The green stone is phospho-calcite—phosphate of copper. The other, chalcopryite—sulphide of copper and iron.—T. O. D.—1. Chrysolite—silicate of magnesia. 2. Chlorite—silicate of magnesia, alumina, and iron. 3. Biotite (hexagonal mica). 4. Fluorspar. 5. Quartz, feldspar, and iron pyrites.—D. F.—1. A fair quality of hematite iron ore. 2. Serpentine and quartz.

COMMUNICATIONS RECEIVED.

On Lightning and Lightning Rods. By E. G. A. On the Chemistry of Electricity. By W. H. G. On New Use for Spect Fruit Cans. By S. W. R. On Track Straightening. By S. W. R.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the Week Ending August 3, 1880, AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for one dollar. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

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|---|------------------|
| Addressing machine, T. A. Edison | 230,621 |
| Animal trap, A. Goodwin | 230,628 |
| Auger, earth, E. A. Smith | 230,530 |
| Baby jumper, C. H. Land | 230,707 |
| Bag or satchel, D. Wilhelm | 230,847 |
| Bag tie and tag holder, B. L. Myers | 230,647 |
| Bale band, wire, E. S. Lenox | 230,759, 230,790 |
| Bale tie, P. K. Dederick | 230,629 |
| Baling press, A. Buckman | 230,736 |
| Bath tub, T. M. Armstrong | 230,684 |
| Beer cooler, J. C. De La Vergne | 230,494 |
| Beer cooler, A. D. Puffer | 230,815 |
| Bird cage fastener, T. L. Maxheimer | 230,795 |
| Birds as decoys, frame for supporting dead, F. A. Allen | 230,500 |
| Boot and shoe seam, J. Popham | 230,654 |
| Boot treeing apparatus, J. A. Ambler | 230,601 |
| Boot treeing machine, Crisp & Copeland | 230,752 |
| Boring and mortising machine, C. R. Brinckerhoff | 230,735 |
| Bottle stopper, T. G. Austen | 230,730 |
| Bottle stopper and fastening, J. M. Lewin | 230,791 |
| Bottle wrapper, Mark & Martinek | 230,701 |
| Bottles, jars, and similar vessels, stopping or closing, H. Barrett | 230,605 |
| Box fastener, A. J. Millard | 230,798 |
| Bricks, coloring and hardening, J. Ambuhl | 230,729 |
| Bridle loop, G. L. Smith | 230,831 |
| Burglar alarm for safe, electric, E. J. Leland | 230,788 |
| Button, D. S. Porter | 230,814 |
| Candy, device for packing, W. B. Howe | 230,778 |
| Cap, P. Goldmann | 230,770 |
| Cap and scarf, convertible traveling, A. Weiler | 230,545 |
| Car brake shoe, J. F. Curtee (r) | 9,329 |