

Business and Personal.

The Charge for Insertion... The Buckeye Engine Co. make a specialty of fitting plain engines with their Automatic Cut-off and Condensers; 30 to 60 per cent economy and perfect governing guaranteed.

Vertical Scientific Grain Mills. A.W.Straub & Co., Phila. For Town and Village use, comb'd Hand Fire Engine & Hose Carriage, \$350. Forsaith & Co., Manchester, N.H.

Bristol Machine Works For Sale. Facilities for all kinds of work. For full particulars, address Bristol Machine Works, Bristol, Pa.

Climax Washing Machine. Reliable Agents wanted. Descriptive circulars furnished. N. C. Baughman & Co., York, Pa.

The great Wheelock Engine, which furnishes the power to the machinery of the American Exhibit at the Paris Exposition this year, is lubricated by Patent Lubricene and Cups. Our exhibit will equal that which we made in Philadelphia in 1876.

Wanted.—A Back Geared, Screw Cutting, Foot Power Lathe. W. J. G., P. O. Box 295, N. Y.

A Microscope with 100 mounted objects for one dollar; circulars free. Address D. L. Smith, Waterbury, Ct.

Velvet Looms Wanted.—Manufacturers please send price lists to W. Lillenthal, 40 Lispenard St., N. Y. city.

Electrical and Mechanical Engineer and Expert. James Hamblet, 114 Tremont St., Boston, Mass.

Wanted.—Cash prices and description, 15 and 30 horse power Stationary Engines and Boilers. Newell Sanders, Chattanooga, Tenn.

Wanted cheap for cash.—A good second-hand Back Geared Screw Machine. Address, giving maker's name, where to be seen, size of hole in spindle, and full particulars, H. A. B. Weymer, 52 N. 6th St., Philadelphia, Pa.

For New and Second Hand Boilers, send to Hilles & Jones, Wilmington, Delaware.

Friction Clutches for heavy work. Can be run at high speeds, and start gradual. Safety Elevators and Hoisting Machinery a specialty. D. Frisbie & Co., New Haven, Ct.

Polishing Tools and Supplies. Send for new price list. Greene, Tweed & Co., 18 Park Place, N. Y.

For Mill Gearing, Shafting, Pulleys, and Hangers, address T. B. Wood & Co., Manufs., Chambersburg, Pa., for price.

Steam Yacht "Hiawatha" for sale.—Length, 40 ft.; beam, 8 ft. 5 in.; engine, 12 H. P.; speed, 12 miles. For particulars apply to J. M. Meredith, Exr., Maiden Creek P. O., Berks Co., Pa.

24 inch Second-hand Planer, and 12 inch Jointer, or Buzz Planer, both in first-class order, for sale by Bentel, Margedant & Co., Hamilton, Ohio.

Wrenches.—The Lipsey "Reliable" is strongest and best. Six inch sample by mail 60 cents. Roper Caloric Engine Manufacturing Co., 91 Washington St., N. Y.

Cornice Brakes. J.M. Robinson & Co., Cincinnati, O.

Bolt Forging Machine & Power Hammers a specialty. Send for circulars. Forsaith & Co., Manchester, N. H.

The Cameron Steam Pump mounted in Phosphor Bronze is an indestructible machine. See ad. back page. Painters' Rapid Graining Process. J.J. Callow, Clev'd, O.

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

Safety Linen Hose for factories, hotels, and stores, as protection from fire. Greene, Tweed & Co., 18 Park Place, 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.

1,000 2d hand machines for sale. Send stamp for descriptive price list. Forsaith & Co., Manchester, N. H.

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.

Sperm Oil, Pure. Wm. F. Nye, New Bedford, Mass.

Bound Volumes of the Scientific American.—I have on hand bound volumes of the Scientific American, which I will sell (singly or together) at \$1 each, to be sent by express. See advertisement on page 318. John Edwards, P. O. Box 788, N. Y.

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

Best Wood Cutting Machinery of the latest improved kinds, eminently superior, manufactured by Bentel, Margedant & Co., Hamilton, Ohio.

Water Wheels, increased power. O.J. Bollinger, York, Pa.

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

Mill Stone Dressing Diamonds. Simple, effective, and durable. J. Dickinson, 64 Nassau St., N. Y.

Weldless Cold-drawn Steel Boiler and Hydraulic Tubes. Leng & Ogden, 212 Pearl St., N. Y.

For Best Insulated Telegraph Wire, Telephone Wire, and Flexible Cordage, Eugene F. Phillips, 67 Stewart St., Providence, R. I. W. H. Sawyer, Electrician and Supt.

Hand Fire Engines, Lift and Force Pumps for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., U.S.A.

The Turbine Wheel made by Risdon & Co., Mt. Holly, N. J., gave the best results at Centennial test.

Vertical & Yacht Engines. N.W. Twiss, New Haven, Ct.

Dead Pulleys, that stop the running of Loose Pulleys and Belts, taking the strain from Line Shaft when Machine is not in use. Taper Sleeve Pulley Works, Erie, Pa.

NEW BOOKS AND PUBLICATIONS.

OLD HOMES MADE NEW. By William M. Woollett. Published by A. T. Bicknell & Co., New York city.

This is a collection of plans, exterior and interior views, illustrating the alteration and remodeling of several suburban residences. The object is to exhibit how buildings of the homely types commonly found in country towns may at small expense be converted into tasteful and even elegant structures. Many of Mr. Woollett's designs have been practically applied, and all are pleasing.

We have received the reports and awards of the Judges of Groups 21, 23, 24, 26, and 27 from the publishers, Messrs. J. B. Lippincott & Co., Philadelphia. The classes considered are Agricultural Machines, Medicine, Architecture, Plastic and Graphic Art, and certain machine tools. These documents will perhaps be useful as records of the Exposition; but as compared to what they might be, we scarcely think them of any particular value.

Notes & Queries

W. McE.—See answer 36, p. 155, vol. 37. —T. W.—From your description we are unable to judge. Possibly the ax, storm, or fire may have been the cause. —R. F. B.—See "Business and Personal" column, for addresses.—M. B. H.—You can find descriptions and details in Weisbach's "Mechanics and Engineering." —M. E. S.—You cannot find all the directions in a book. Bourne's "Catechism of the Steam Engine," and Forney's "Catechism of the Locomotive," contain useful information on the subject.—H. R. B.—See answer No. 6, issue of April 13.—J. T. E.—You do not send enough details to enable us to form a decided opinion, but we imagine that the area of the chimney or some of the flues is too small. A simple remedy would be to make the surroundings of the boiler fireproof.—E. S. R.—It will be better to use a non-metallic handle.—W. A. S.—See answer No. 19, p. 155, issue of March 9, 1878. For your purpose the core need not be a permanent magnet, but may be of soft iron.

(1) C. H. & Co. write: We are manufacturers of cream colored earthen ware. Please inform us what to mix with the clay to have it a red color after it is burnt. A. Use a small quantity of red oxide of iron or red ochre.

(2) H. P. S. asks how to make an umbrella cover waterproof? A. Apply first a strong hot aqueous solution of soap, then solution of alum, sulphate of alumina, or lead acetate (sugar of lead); again the soap solution, and finally wash with hot water.

(3) W. D. S. asks: 1. Would it be possible forme to run hydrogen gas through the gas pipes of my house for lighting purposes instead of common illuminating gas? A. Hydrogen gas, when burning, gives a very pale bluish flame, insufficient for illuminating purposes. 2. Would there be any danger of the reservoir bursting, or could I keep it in the cellar safely? A. There would be danger. 3. How is hydrogen gas made? A. It is obtained in quantities by the action of dilute sulphuric acid upon scraps of iron or zinc contained in a large airtight vessel, connected by a pipe with the gas receiver, or by passing steam through red hot iron filings contained in an iron pipe, and collecting the gas over water.

(4) W. C. S. writes: Please give me a recipe for making a good quality of shoemakers' ink, to blacken the sole edges and heels of boots and shoes while damp, to be afterward polished with a hot iron made for the purpose. A. Dissolve an equal quantity each of ferrous sulphate (copperas) and gum arabic in a small quantity of boiling water, and add a very little extract of logwood solution. If it gums, dilute it a little with hot water. Concentrated solution of shellac in hot aqueous solution of borax is sometimes used in place of a portion of the gum.

(5) F. L. W. writes: The ceramic fever has led me to ask if there is any mode of transferring an engraving from the paper on which it is originally printed to any object, without requiring pressure to any great amount? A. Paper is prepared with bichromated gelatin, dried, and exposed to strong sunlight for some time beneath, and in contact with, a drawing or wood cut rendered translucent by oil (castor oil answers). The excess of chrome salt is removed by washing. The paper is then transferred, picture side down, to a plate of gypsum. A positive copy is thus obtained from a positive drawing, as only the unaltered gelatin sinks into the gypsum. By replacing the carbon of the ink with enamel colors designs can be printed on and burned into unglazed porcelain, etc.

(6) R. H. L. writes: I wish to etch broad letters and figures on glass by means of hydrofluoric acid gas. What wax or varnish is used which can be readily removed from the surfaces to be etched? A. Use beeswax or paraffin; warm the glass.

(7) C. A. A. writes: After the fruit is removed from peach cans we find the tin inside beautifully mottled like pearl. 1. Can this peculiar pearl-like mottle be given to common sheet tin artificially at a low cost? A. Wash the tin plate quickly with a mixture of 3 parts hydrochloric acid, 1 part nitric acid, and 3 parts water; rinse in water and dry with warm sawdust. The mother-of-pearl appearance—moire metallique—is preserved by a thin lacquer of pale shellac in alcohol. 2. Can the mottles be made small or large at will? A. No; their size depends in a great measure upon the rapidity with which the plate was cooled on leaving the tin bath.

(8) J. S. B. asks: Does the Jablochhoff electric candle throw out much heat? A. Compared with the illuminating power, the amount of heat radiated from the candle is relatively small.

(9) S. K. S. asks: What quantity and number of covered wire must I use to make the strongest horseshoe electro-magnet, having a 3/8 inch core, using a Daniell battery of six cups, and what length should

each coil be? A. Wind a sufficient quantity of No. 20 copper wire (magnet insulation) to make each spool 1 1/2 inch in diameter and 3 1/4 inches long.

(10) C. W. asks: 1. How strong should telephone magnets be? A. They should be able to lift about their own weight of iron. 2. Should the spool wire touch the magnet? A. No; the core should be first covered with one or two layers of thin paper, and then wound with the insulated wire. 3. Will ferrotype plate answer for the disks? A. Yes. 4. Will two parallel cotton-covered wires, the size of fine sewing needles, laid close together, do to connect the instruments? A. Yes. 5. My instruments do not work, although I used about 1/2 oz. of No. 40 silk covered wire on each spool, the same length on both. A. Use more magnet wire wound in the manner mentioned in the answer to your second question, and see answer No. 19, p. 155, SCIENTIFIC AMERICAN of March 9, 1878.

(11) G. A. A. writes: I wish to run a steam pipe from a boiler to my house, a distance of 300 feet underground. What is the best non-conductor, for packing the pipe, and how should it be laid? A. Asbestos is one of the best non-conductors, but is rather expensive. You can do pretty well by laying the pipe in a box, surrounded by coal ashes.

(12) F. H. M. asks: What is the rule for making a counterbalanced face wheel for engines? I had a crank engine (portable) that did not stand steady. The crank end of the connecting rod and fittings weigh 11 lbs., and the wrist pin 2 lbs. A triangular piece weighing 16 lbs. was put in the face wheel, which was said to be right, but it is no better than before. The engine is 6 x 12 inches, running 170 revolutions per minute. A. It is a common practice to place the counterweight directly opposite the crank, with its center of gravity at the same distance from the center of the shaft as the center of the crank pin, making its weight equal to weight of piston, piston rod, crosshead, and crank pin, plus half the weight of the connecting rod.

(13) C. H. S. asks: In fastening two pieces of wood with nails, which will make the stronger joining, to bore the outside piece, or force the nail through in the common way? A. The latter, we think.

(14) D. C. asks: How is the cold rolled shafting made so true as it is? A. By being passed through the rolls under heavy pressure.

(15) E. C. asks: 1. Which would be the best boiler to use for driving a thrashing machine, one built on locomotive style, or vertical? A. There is not a great deal of difference. There may possibly be a little advantage in the use of the locomotive type. 2. In running over rough roads with steam up, would there be any danger of explosion from turning and jolting? A. No. 3. Could an 8 horse power engine be moved with its own power without the use of horses to haul it? A. Yes.

(16) S. W. H. writes: A person here says that it takes 25 per cent more coal to make steam from water that is returned to the boiler from the steam radiators used in warming buildings, than if water from a river or well were used. Is it so? A. Ordinarily it is more economical to use the condensed steam from the radiators.

(17) G. F. P. writes: I think that a 2 horse power engine will give 4 horse power by connecting a 5 inch pulley on its main shaft to a 10 inch pulley on its driver shaft, by a belt, losing, of course, half the original speed. Is this correct? A. No.

(18) R. N. writes: J. C. can melt small quantities of brass easily in a common cylinder stove with a good draught, using hard coal, and setting the crucible well down into the fire. I have tried melting on the forge, and find this much easier and better.

(19) W. S. P. asks: How can I make a good quality of lemon sirup? A. Lemon juice (strained or defecated), 1 pint; sugar, 2 1/2 lbs.; dissolve by gentle heat and set it aside; in 24 hours remove the scum and decant the clear liquid. The common soda water sirups are made by dissolving in a gallon of water 8 lbs. of sugar, 2 ozs. of gum arabic, and about 1/2 oz. of tartaric acid; strained through uncolored flannel, and flavored to suit with any of the fruit extracts or ethers.

(20) J. C. L. asks: Is steam visible before it comes in contact with the atmosphere? A. No.

(21) A. E. R. asks: 1. How can the power of the voice be increased? A. The effect, in public halls, may be increased by sounding boards and by attention to the laws of acoustics in constructing buildings; the actual power can only be increased by practice. 2. Will the phonograph make less demand for shorthand reporters? A. It may.

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

G. M. P.—The specimen in the red box is a micaceous clay; might be useful to makers of wall papers.—J. F. K.—The talcose schist may be auriferous. The sample does not appear to be.—G. F. L.—No. 1 is brown hematite and shale. No. 2 has every appearance of being a slag. It gives the reactions for iron. No. 3 is lithographic stone.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure the receipt of original papers and contributions on the following subjects: Pendulum Experiment. By O. T. Aerial Navigation. By H. C. H. Quackery. By T. A. Electrical and Acoustic Observations. By J. W. S. Rapid Locomotive Building. By J. M. D. Duration of Impressions on the Retina. By H. T. Estimation of Sulphur in Organic Compounds. By W. W. I. and C. F. The Metric System. By G. N. W. Astronomic Discrepancies. By L. S. B. Does the Sun Move? New Optical Apparatus. By J. V. C. What is Life? By T. R. McC. and E. R. E. A Brilliant Meteor. By R. D. S.

Advertisements.

Inside Page, each insertion --- 75 cents a line. Back Page, each insertion --- \$1.00 a line. (About eight words to a line.)

Engravings may head advertisements at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

WARRANTED THE BEST. 1 H. P. Boiler & Engine, \$150. 2 H. P., \$175. 3 H. P., \$200. Tested to 200 lbs. Steam. LOVEGROVE & CO., 152 N. 3d St., Philadelphia, Pa., Builders of Engines and Boilers, 1 to 100 horse power. Send for circulars and prices, and state size and style you want.

INCORUSTATIONS ON BRICK WALLS. By WILLIAM THATCHER. The various causes; Bricks Ruined with Coal Fires; Sulphate of Magnesia; Dampness; Effect of common Mortar. Remedies. Also Report of Sub-committee on the same subject, appointed by the University of Pennsylvania. Contained in SCIENTIFIC AMERICAN SUPPLEMENT No. 123. Price 10 cents. To be had at this office and of all newsdealers.

SECOND-HAND ENGINES. Portable and Stationary at Low Prices. HARRIS IRON WORKS, TITUSVILLE, PA.

MINTON'S TILES. Art, Decorative and Flooring. Remit 9 cents postage for circulars. Anderson Merchant & Co., 53 Broadway, N.Y.

THE ONLY Genuine GEISER SELF-REGULATING GRAIN SEPARATOR. Celebrated for its light and smooth movements, also REPAIRING and CLEANING all kinds of grain. Manufactured only by THE GEISER MFG Co., Waynesboro, Franklin Co., Pa.

SETON HALL College South Orange, N. J. Healthful, comfortable, modern. LATEST and Best Books on Steam Engineering. Send stamp for catalogue. F. KIPPY, Bridgeport, Conn.

PIANO Beautiful \$1,600 Concert Grand Pianos only \$425. Superb \$1,100 Grand Square Pianos only \$255. Elegant \$800 Upright Pianos, \$155. New Style Upright Pianos, \$112.50. New Organs \$35. Handsome Parlor Organs, 12 Stops, 3 Set Magnets, only \$72.50. Church Organs, 16 Stops, only \$104.50. Immense New Steam Factory soon to be erected. Paper with much information about eos. of Pianos and Organs SENT FREE. Address DANIEL F. BEATTY, Washington, N. J.

LEHIGH UNIVERSITY.—Tuition Free. CIVIL, MECHANICAL and MINING ENGINEERING; CHEMISTRY and METALLURGY; FULL CLASSICAL INSTRUCTION; FRENCH and GERMAN; ENGLISH LITERATURE; INTERNATIONAL and CONSTITUTIONAL LAW; PSYCHOLOGY and CHRISTIAN EVIDENCES. For Registers address The Rev. John M. Leavitt, D.D., President, Bethlehem, Penna.

TELEPHONE MATERIALS SENT TO any address upon receipt of price, by draft money order or registered letter. Wound Bobbins of correct size, and of Finest Silk-covered, Pure Copper Wire, 75c. each; Steel Magnets, Powerfully Charged 50c. each; Turned and Polished Wood Handles, 75c. each; Binding Posts, 3 c. per pair; all the Parts for a Pair of First-class Telephones, except the Diaphragms, \$4.00. J. H. BUNNELL, 112 Liberty Street, New York.

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